Energy Use Data Handbook,

1990 and 1997 to 2003

June 2005

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Canada

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Preface

This is the fourth edition of the *Energy Use Data Handbook, 1990 and 1997 to 2003*, which fulfils part of the mandate of Natural Resources Canada's Office of Energy Efficiency (OEE) to strengthen and expand Canada's commitment to energy efficiency in order to reduce greenhouse gas (GHG) emissions that contribute to climate change.

The main objective of the handbook is to provide a statistical overview of Canada's sectoral energy markets. The GHG emissions figures presented herein are for analytical purposes. Readers should consult Environment Canada's publication *Canada's Greenhouse Gas Inventory* for the official GHG inventory. For further analysis of the data contained in this publication, refer to the handbook's companion document entitled ***Energy Efficiency Trends in Canada, 1990 to 2003***.

The fourth edition of the handbook differs from the previous ones in several ways:

- the commercial/institutional sector has been reorganized; it is now grouped according to type of activity (as per the North American Industry Classification System) instead of type of building;
- due to the confidentiality of aggregate coal and propane consumption data at the provincial level, these fuels are now reported together;
- data are presented for 1990 and 1997 to 2003 for all sectors; and
- a CD, containing electronic versions of this publication, its companion document, energy and GHG emissions analysis tables, as well as detailed data tables for Canada for the period 1984 to 2003, is available.

The handbook covers six sectors at an aggregate level: residential, commercial/institutional, industrial, transportation, agriculture and electricity generation. The year 1990 is the reference year for the Kyoto Protocol, whereas 2003 is the most recent year for which actual data are available.

This handbook provides data on energy use and GHG emissions as well as information on major activities and relevant indicators influencing energy use. Such data form the foundation for OEE analysis in publications such as *Energy Efficiency Trends in Canada, 1990 to 2003*, which assesses factors that influence changes in energy use and related changes in GHGs.

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A comprehensive database, including most data that the OEE uses for its analysis of historical energy use and GHG emissions, is available from the following Web site: *oee.nrcan.gc.ca/tables05*.

For more information on this product or other services, contact the OEE by e-mail at *euc.cec@nrcan.gc.ca*.

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Chapter 1
Total End-Use Sector

The Data Situation

The aggregate energy use data presented in this handbook are based on Statistics Canada's *Report on Energy Supply-Demand in Canada* (Cat. No. 57-003-XIB), Canada's official report on the energy supply and demand balance in Canada. Greenhouse gas emissions data are estimated using emissions factors developed by Environment Canada.

The Office of Energy Efficiency has developed energy models and/or databases for each sector of the economy presented in this report (i.e. residential, commercial/institutional, industrial, transportation, agriculture and electricity generation) to assess trends in energy use in the Canadian economy.

Crude oil and natural gas commodity prices (or wholesale prices) are from the Petroleum Resources Branch of Natural Resources Canada. The crude oil wellhead price is from the Energy Information Administration of the United States Department of Energy.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Canada's Secondary Energy Use and GHG Emissions by Energy Source

	1990	1991–1996	1997	1998
Total Energy Use (PJ) [a,b,c]	6,950.8		7,737.6	7,573.3
Energy Use by Energy Source (PJ)				
Electricity	1,550.1		1,717.0	1,703.6
Natural Gas	1,777.6		2,082.8	1,919.8
Motor Gasoline	1,176.5		1,257.9	1,307.8
Oil [1]	1,201.3		1,290.7	1,262.5
Aviation Gasoline	5.5		3.7	3.9
Aviation Turbo Fuel	181.9		210.9	222.8
Still Gas and Petroleum Coke	321.7		350.5	335.9
Wood Waste and Pulping Liquor	341.0		399.8	416.3
Other [2]	310.0		325.2	314.5
Residential Wood	85.3		99.0	86.6
Total GHG Emissions Including Electricity (Mt) [a,b,c,d]	407.9		447.2	450.1
GHG Emissions by Energy Source (Mt)				
Electricity	87.1		94.7	106.0
Natural Gas	89.5		103.9	95.7
Motor Gasoline	84.0		89.9	92.6
Oil [1]	89.7		96.2	94.3
Aviation Gasoline	0.4		0.3	0.3
Aviation Turbo Fuel	13.2		15.2	15.7
Still Gas and Petroleum Coke	20.9		22.7	22.6
Wood Waste and Pulping Liquor	0.0		0.0	0.0
Other [2]	21.4		22.5	21.5
Residential Wood	1.6		1.8	1.6
Total GHG Emissions Excluding Electricity (Mt) [a,b,c,d]	320.7		352.5	344.1

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Oil" includes diesel fuel oil, light fuel oil, kerosene and heavy fuel oil.
2) "Other" includes coal, coke, coke oven gas, LPG and Gas Plant NGL, steam and waste fuels.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990 -2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
d) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990 -2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
7,815.5	8,098.8	7,892.6	8,196.2	8,457.3	21.7%
1,738.5	1,799.1	1,797.2	1,855.0	1,887.4	21.8%
1,966.7	2,127.8	1,961.9	2,111.0	2,188.6	23.1%
1,340.7	1,341.8	1,358.4	1,386.0	1,408.0	19.7%
1,784.2	1,346.3	1,328.5	1,295.4	1,427.1	16.8%
3.6	3.4	3.5	3.5	3.2	-42.2%
233.9	235.9	215.1	224.6	222.5	22.3%
349.4	341.4	378.8	443.1	437.2	35.9%
464.0	464.4	421.1	458.6	464.7	36.3%
321.2	334.5	329.8	315.0	309.1	-0.3%
93.3	104.0	98.3	104.1	109.5	28.4%
456.8	478.4	474.0	481.0	501.8	23.0%
103.6	112.4	116.4	113.4	120.4	38.1%
99.1	106.5	98.0	105.4	109.0	21.8%
94.9	95.0	96.1	98.1	99.7	18.7%
95.9	100.5	99.1	96.5	106.1	18.2%
0.3	0.3	0.3	0.3	0.2	-42.2%
16.4	16.6	15.1	15.8	15.6	18.9%
23.0	22.6	25.1	28.7	28.3	25.4%
0.0	0.0	0.0	0.0	0.0	–
21.8	22.6	22.0	20.9	20.5	-4.5%
1.7	1.9	1.8	1.9	2.0	28.4%
353.1	366.1	357.5	367.5	381.4	18.9%

Canada's Secondary Energy Use by Sector, End-Use and Sub-Sector

	1990	1991–1996	1997	1998
Total Energy Use (PJ) [a,b,c]	**6,950.8**		**7,737.6**	**7,573.3**
Residential [a,b]	**1,289.3**		**1,394.1**	**1,270.1**
Space Heating	781.6		858.4	738.2
Water Heating	269.8		290.4	285.1
Appliances	176.4		179.5	176.0
Major Appliances	*132.1*		*121.1*	*117.3*
Other Appliances[1]	*44.4*		*58.4*	*58.8*
Lighting	53.2		56.4	56.3
Space Cooling	8.3		9.4	14.4
Commercial/Institutional [a,c,f]	**867.0**		**998.5**	**944.1**
Space Heating	447.3		525.9	467.9
Water Heating	51.1		63.1	60.6
Auxiliary Equipment	84.7		91.8	90.3
Auxiliary Motors	102.5		112.2	109.5
Lighting	134.5		153.4	148.6
Space Cooling	38.0		44.5	59.8
Street Lighting	8.9		7.4	7.5
Industrial [a,d]	**2,717.4**		**2,997.8**	**2,939.0**
Mining	343.4		474.2	457.8
Pulp and Paper	747.5		823.4	823.2
Iron and Steel	219.4		251.2	254.7
Smelting and Refining	183.3		231.0	239.8
Cement	59.3		57.8	60.4
Chemicals	223.2		245.9	241.2
Petroleum Refining	334.9		320.9	291.9
Other Manufacturing	531.8		532.8	510.4
Forestry	7.7		11.1	12.3
Construction	66.9		49.5	48.0

1991–1998 data available at: oee.nrcan.gc.ca/handbook05

1) "Other Appliances" includes small appliances such as televisions, video cassette recorders, digital video disc players, radios, computers and toasters.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
d) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
e) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
f) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2003*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
7,815.5	8,098.8	7,892.6	8,196.2	8,457.3	21.7%
1,325.5	1,391.9	1,338.2	1,390.8	1,457.6	13.8%
783.5	845.5	781.1	824.4	873.4	11.7%
290.4	294.2	293.1	299.7	311.8	15.6%
176.9	180.8	183.8	182.1	189.0	7.1%
116.0	*116.8*	*117.0*	*114.1*	*116.8*	*-11.5%*
60.9	*64.0*	*66.8*	*67.9*	*72.2*	*62.8%*
57.8	60.2	62.0	62.1	65.6	23.4%
17.0	11.2	18.3	22.4	17.7	112.8%
979.2	1,072.8	1,060.9	1,131.5	1,180.9	36.2%
502.2	573.6	561.8	593.3	644.0	44.0%
63.5	68.5	70.3	70.8	76.2	49.0%
88.9	98.5	96.1	98.4	106.1	25.3%
107.7	116.2	109.5	114.8	114.1	11.3%
145.9	160.9	149.9	158.1	158.1	17.6%
63.4	47.4	65.6	87.4	73.4	93.2%
7.4	7.7	7.7	8.7	9.0	0.6%
3,028.1	3,120.3	2,998.1	3,160.9	3,245.7	19.4%
459.6	516.8	522.3	562.2	629.0	83.1%
891.8	894.2	812.2	847.5	850.0	13.7%
259.8	257.6	228.5	239.5	233.7	6.5%
236.4	234.7	248.8	255.0	263.3	43.6%
63.5	63.6	61.9	64.8	62.0	4.5%
240.4	230.1	207.8	200.5	191.1	-14.4%
288.0	295.1	311.4	365.2	375.0	12.0%
523.5	562.0	538.9	555.1	566.3	6.5%
14.8	16.2	18.3	17.1	18.7	142.4%
50.4	49.9	47.9	54.2	56.7	-15.2%

continued ——

Canada's Secondary Energy Use by Sector, End-Use and Sub-Sector *(continued)*

	1990	1991–1996	1997	1998
Total Transportation [a]	1,877.9		2,117.2	2,194.5
Passenger Transportation [a,b]	*1,149.2*		*1,225.0*	*1,269.5*
Cars	643.3		637.9	642.5
Light Trucks	269.2		329.2	355.8
Motorcycles	1.9		1.9	2.1
Buses	49.9		48.3	50.6
Air	180.2		205.4	216.1
Rail	4.7		2.3	2.4
Freight Transportation [a,c]	*675.3*		*825.1*	*854.4*
Light Trucks	131.6		150.9	161.1
Medium Trucks	123.1		138.0	142.2
Heavy Trucks	222.0		348.9	347.2
Air	7.3		9.2	10.6
Rail	84.7		77.9	74.2
Marine	106.5		100.1	119.2
Off-Road [d]	*53.3*		*67.1*	*70.6*
Agriculture [e]	199.2		230.0	224.7

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
d) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
e) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
f) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

continued

1999	2000	2001	2002	2003	Total Growth 1990–2003
2,252.8	2,281.9	2,277.3	2,306.2	2,361.3	25.7%
1,307.6	*1,302.6*	*1,283.5*	*1,307.3*	*1,322.4*	*15.1%*
650.8	636.9	629.8	631.6	641.5	-0.3%
372.9	380.0	390.5	404.6	411.4	52.8%
2.1	2.2	2.2	2.4	2.6	38.6%
52.8	53.6	51.6	51.7	52.4	5.0%
226.3	227.1	206.6	214.4	211.9	17.6%
2.7	2.9	2.9	2.6	2.6	-45.2%
869.6	*899.2*	*904.6*	*907.4*	*945.8*	*40.1%*
166.0	165.8	170.9	174.2	177.4	34.8%
133.7	134.1	134.2	138.7	142.2	15.5%
368.8	393.0	385.6	398.8	438.2	97.4%
11.3	12.2	12.0	13.7	13.8	89.6%
78.4	80.2	78.8	71.5	71.2	-15.9%
111.5	114.0	123.2	110.5	103.1	-3.2%
75.6	*80.0*	*89.2*	*91.5*	*93.1*	*74.4%*
229.9	231.9	218.1	206.8	211.9	6.4%

Canada's GHG Emissions by Sector, End-Use and Sub-Sector – Including Electricity-Related Emissions

	1990	1991–1996	1997	1998
Total GHG Emissions Including Electricity (Mt) [a][b][c][d][e][f]	407.9		447.2	450.1
Residential [a][b][c]	69.5		72.7	69.5
Space Heating	41.5		43.8	38.4
Water Heating	14.7		15.4	15.8
Appliances	9.9		9.9	10.9
Major Appliances	*7.4*		*6.7*	*7.2*
Other Appliances [1]	*2.5*		*3.2*	*3.7*
Lighting	3.0		3.1	3.5
Space Cooling	0.5		0.5	0.9
Commercial/Institutional [a][b][c][d][e][f]	47.8		54.2	54.2
Space Heating	24.3		28.1	25.1
Water Heating	2.8		3.4	3.3
Auxiliary Equipment	4.8		5.1	5.6
Auxiliary Motors	5.8		6.2	6.8
Lighting	7.6		8.5	9.2
Space Cooling	2.1		2.4	2.6
Street Lighting	0.5		0.4	0.5
Industrial [a][e][f]	141.7		152.3	153.6
Mining	21.4		28.9	28.9
Pulp and Paper	24.2		23.7	23.9
Iron and Steel	15.9		17.3	17.8
Smelting and Refining	10.8		13.2	15.0
Cement	4.1		4.0	4.2
Chemicals	10.8		12.5	12.8
Petroleum Refining	20.8		20.2	19.0
Other Manufacturing	28.6		28.1	27.7
Forestry	0.6		0.9	1.0
Construction	4.6		3.4	3.4

1991–1998 data available at oee.nrcan.gc.ca/handbook05

1) "Other Appliances" includes small appliances such as televisions, video cassette recorders, digital video disc players, radios, computers and toasters.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
d) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
e) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990-2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).
f) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
g) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
456.8	478.4	474.0	481.8	501.8	23.0%
71.1	75.8	74.2	74.9	79.8	14.8%
40.3	43.8	40.7	42.1	45.1	8.7%
15.8	16.3	16.5	16.5	17.4	18.5%
10.5	11.2	11.8	11.1	12.0	21.1%
6.9	*7.2*	*7.5*	*6.9*	*7.4*	*-0.3%*
3.6	*4.0*	*4.3*	*4.2*	*4.6*	*84.7%*
3.4	3.8	4.0	3.8	4.2	40.0%
1.0	0.7	1.2	1.4	1.1	141.4%
55.0	61.6	62.1	64.6	69.3	44.9%
26.9	31.0	30.7	32.2	35.8	47.6%
3.5	3.8	3.9	3.9	4.3	50.9%
5.3	6.1	6.2	6.0	6.8	41.8%
6.4	7.3	7.1	7.0	7.3	26.3%
8.7	10.0	9.7	9.7	10.1	33.4%
3.7	2.9	4.1	5.2	4.5	111.3%
0.4	0.5	0.5	0.5	0.6	14.2%
153.4	161.3	159.2	162.1	168.9	19.2%
28.8	32.3	32.4	33.6	37.6	75.6%
24.3	25.1	23.5	22.3	23.0	-5.1%
18.1	18.1	16.5	16.8	16.5	4.3%
14.2	14.7	16.0	15.6	16.8	56.1%
4.5	4.5	4.4	4.7	5.6	11.6%
12.6	12.2	11.0	10.4	10.1	-6.8%
18.2	18.9	20.2	23.2	23.7	13.8%
28.1	30.8	30.1	30.4	31.3	9.3%
1.2	1.3	1.5	1.4	1.5	143.5%
3.5	3.5	3.4	3.6	3.9	-14.3%

continued ——

Canada's GHG Emissions by Sector, End-Use and Sub-Sector – Including Electricity-Related Emissions *(continued)*

	1990	1991–1996	1997	1998
Total Transportation **	135.0		152.1	156.8
Passenger Transportation*	*81.9*		*87.4*	*89.6*
Cars	45.5		45.1	45.0
Light Trucks	19.4		23.8	25.5
Motorcycles	0.1		0.1	0.1
Buses	3.5		3.4	3.6
Air	13.0		14.9	15.2
Rail	0.4		0.2	0.2
Freight Transportation*	*49.4*		*60.0*	*62.3*
Light Trucks	9.3		10.7	11.4
Medium Trucks	8.9		9.9	10.2
Heavy Trucks	15.8		24.9	25.0
Air	0.5		0.7	0.7
Rail	6.7		6.2	6.0
Marine	8.1		7.7	9.0
Off-Road*	*3.7*		*4.7*	*4.9*
Agriculture **	13.7		16.0	16.0

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
d) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
e) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).
f) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
g) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

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1999	2000	2001	2002	2003	Total Growth 1990–2003
161.0	163.2	162.9	164.9	168.8	**25.0%**
92.3	*92.0*	*90.7*	*92.4*	*93.5*	***14.1%***
45.6	44.7	44.2	44.3	45.0	-1.0%
26.7	27.2	28.0	29.0	29.5	51.7%
0.1	0.2	0.2	0.2	0.2	37.2%
3.7	3.8	3.6	3.6	3.7	6.3%
15.9	16.0	14.5	15.1	14.9	14.4%
0.2	0.2	0.2	0.2	0.2	-44.6%
63.5	*65.7*	*66.1*	*66.2*	*68.9*	***39.5%***
11.8	11.8	12.1	12.4	12.7	36.2%
9.6	9.7	9.7	10.0	10.2	15.5%
26.6	28.3	27.8	28.7	31.5	99.3%
0.8	0.9	0.8	1.0	1.0	84.4%
6.3	6.4	6.3	5.7	5.7	-15.1%
8.5	8.6	9.3	8.4	7.8	-4.4%
5.3	*5.6*	*6.2*	*6.4*	*6.5*	***72.7%***
16.3	16.5	15.5	14.5	15.0	**9.0%**

Canada's GHG Emissions by Sector, End-Use and Sub-Sector – Excluding Electricity-Related Emissions

	1990	1991–1996	1997	1998
Total GHG Emissions Excluding Electricity (Mt) [a,b,c]	320.7		352.5	344.1
Residential [a,b,c]	43.2		46.0	40.5
Space Heating	34.4		35.9	30.7
Water Heating	8.7		9.9	9.6
Appliances	0.2		0.2	0.2
Major Appliances	*0.2*		*0.2*	*0.2*
Other Appliances[1]	*0.0*		*0.0*	*0.0*
Lighting	0.0		0.0	0.0
Space Cooling	0.0		0.0	0.0
Commercial/Institutional [a,b,c]	25.9		30.1	27.4
Space Heating	22.8		26.0	23.4
Water Heating	2.5		3.2	3.0
Auxiliary Equipment	0.5		0.7	0.6
Auxiliary Motors	0.0		0.0	0.0
Lighting	0.0		0.0	0.0
Space Cooling	0.1		0.2	0.3
Street Lighting	0.0		0.0	0.0
Industrial [a,c]	104.7		110.5	105.8
Mining	15.6		22.5	21.4
Pulp and Paper	14.3		12.4	11.4
Iron and Steel	14.2		15.5	15.5
Smelting and Refining	3.3		3.3	3.6
Cement	3.8		3.6	3.7
Chemicals	7.1		8.9	8.6
Petroleum Refining	19.7		19.2	17.9
Other Manufacturing	21.7		20.8	19.4
Forestry	0.6		0.9	1.0
Construction	4.6		3.4	3.4

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Other Appliances" includes small appliances such as televisions, video cassette recorders, digital video disc players, radios, computers and toasters.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
d) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
e) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).
f) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
g) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
353.1	366.1	357.5	367.5	381.4	18.9%
42.5	44.7	41.5	43.2	45.2	4.4%
32.5	34.7	31.6	33.1	34.7	0.9%
9.8	9.9	9.7	9.9	10.2	17.6%
0.2	0.2	0.2	0.2	0.3	37.9%
0.2	*0.2*	*0.2*	*0.2*	*0.3*	*37.9%*
0.0	*0.0*	*0.0*	*0.0*	*0.0*	–
0.0	0.0	0.0	0.0	0.0	–
0.0	0.0	0.0	0.0	0.0	–
28.9	33.3	33.2	35.4	39.1	50.9%
24.7	28.7	28.2	30.1	32.7	43.6%
3.2	3.5	3.6	3.6	4.0	57.1%
0.6	0.7	1.0	1.0	1.7	248.2%
0.0	0.0	0.0	0.0	0.0	–
0.0	0.0	0.0	0.0	0.0	–
0.4	0.3	0.5	0.7	0.7	759.1%
0.0	0.0	0.0	0.0	0.0	–
106.7	110.7	106.7	111.8	115.9	10.6%
21.9	24.8	24.3	25.9	29.6	89.8%
11.4	11.2	10.0	9.3	9.2	-35.6%
15.8	15.8	13.9	14.3	14.2	0.0%
3.4	3.2	3.5	3.2	3.2	-1.0%
4.0	4.0	4.0	4.2	4.2	10.7%
8.5	7.9	6.8	6.2	5.8	-18.5%
17.1	17.7	18.9	22.0	22.4	13.9%
19.9	21.3	20.5	21.4	21.9	1.2%
1.2	1.3	1.5	1.4	1.5	143.5%
3.5	3.5	3.4	3.8	3.9	-14.3%

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Canada's GHG Emissions by Sector, End-Use and Sub-Sector – Excluding Electricity-Related Emissions *(continued)*

	1990	1991–1996	1997	1998
Total Transportation **	134.9		152.0	156.6
Passenger Transportation **	*81.7*		*87.2*	*89.4*
Cars	45.5		45.1	45.0
Light Trucks	19.4		23.8	25.5
Motorcycles	0.1		0.1	0.1
Buses	3.3		3.2	3.4
Air	13.0		14.9	15.2
Rail	0.4		0.2	0.2
Freight Transportation **	*49.4*		*60.0*	*62.3*
Light Trucks	9.3		10.7	11.4
Medium Trucks	8.9		9.9	10.2
Heavy Trucks	15.8		24.9	25.0
Air	0.5		0.7	0.7
Rail	6.7		6.2	6.0
Marine	8.1		7.7	9.0
Off-Road **	*3.7*		*4.7*	*4.9*
Agriculture **	12.0		14.0	13.8

1991–1996 data available at: oee.nrcan.gc.ca/handbook96

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
d) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
e) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).
f) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
g) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

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1999	2000	2001	2002	2003	Total Growth 1990–2003
160.9	163.0	162.7	164.7	168.6	25.0%
92.1	*91.8*	*90.5*	*92.2*	*93.3*	*14.1%*
45.6	44.7	44.2	44.3	45.0	-1.0%
26.7	27.2	28.0	29.0	29.5	51.7%
0.1	0.2	0.2	0.2	0.2	37.2%
3.5	3.6	3.4	3.4	3.5	5.4%
15.9	16.0	14.5	15.1	14.9	14.4%
0.2	0.2	0.2	0.2	0.2	-44.6%
63.5	*65.7*	*66.1*	*66.2*	*68.9*	*39.5%*
11.8	11.8	12.1	12.4	12.7	36.2%
9.6	9.7	9.7	10.0	10.2	15.5%
26.6	28.3	27.8	28.7	31.5	99.3%
0.8	0.9	0.8	1.0	1.0	84.4%
6.3	6.4	6.3	5.7	5.7	-15.1%
8.5	8.6	9.3	8.4	7.8	-4.4%
5.3	*5.6*	*6.2*	*6.4*	*6.5*	*72.7%*
14.2	14.3	13.3	12.4	12.7	5.7%

Commodity Prices and Background Indicators

	1990	1991–1996	1997	1998
Commodity Prices				
Crude Oil Prices				
Wellhead U.S. Average ($US/bbl.)[a]	20.03		17.23	10.87
Edmonton Par[1] ($/m³)[b]	173.95		173.86	126.46
Brent Montréal[2] ($/m³)[a]	187.35		180.39	134.07
Natural Gas Price at AECO-C Hub (intra-Alberta)[3] ($/GJ)[a]	*1.34*		*1.75*	*1.92*
Background Indicators				
Total GDP (million $97)[c]	*707,669*		*816,763*	*848,963*
Industrial	199,811		225,711	234,841
Commercial/Institutional	471,513		550,439	572,928
Agriculture	13,627		13,614	14,693
Electricity Generation	20,049		22,417	21,881

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Edmonton crude oil price is based on the price of West Texas Intermediate (WTI) crude, sold on the Chicago Mercantile Exchange. Edmonton par is priced to be competitive with WTI, taking into account transportation costs.
2) Brent Montréal crude oil is the cost of Brent crude oil (in the Montréal market) including the transportation costs through the Portland-Montréal oil pipeline.
3) AECO-C hub is the main pricing point for Alberta natural gas and represents the major pricing point for Canadian gas.

Sources:
a) The Energy Information Administration (EIA), *Monthly Energy Review*, Table 9.1, August 2004.
b) Natural Resources Canada, Petroleum Resources Branch, Ottawa, December 2004.
c) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
15.56	26.72	21.84	22.51	27.56	37.6%
172.16	278.98	246.69	253.44	274.10	57.6%
180.44	280.95	267.48	263.13	275.71	41.2%
2.77	*4.81*	*5.91*	*3.83*	*6.31*	*370.9%*
896,556	*946,834*	*961,476*	*992,733*	*1,015,974*	*43.6%*
249,318	271,254	266,003	270,430	275,426	37.8%
604,503	633,917	655,283	681,768	697,017	47.8%
15,980	15,181	13,056	12,499	14,148	3.8%
21,883	21,651	20,859	21,297	20,724	3.4%

Chapter 2
Residential Sector

The Data Situation

Aggregate data on residential energy use is reported in Statistics Canada's *Report on Energy Supply-Demand in Canada* (RESD) (Cat. No. 57-003-XIB), whereas its *Survey of Household Spending* (SHS) collects additional data on the characteristics of residential equipment and housing stock. Before 1997, which was the first year Statistics Canada conducted the survey, the *Household Facilities and Equipment Survey* (HFE) collected similar data. The residential stock estimates in this handbook derive from both surveys; however, although the surveys use similar methodologies, they are not identical. Furthermore, because there was a re-base of the SHS data in 1999, significant processing of the data was necessary to merge the information.

Natural Resources Canada (NRCan) has also collected additional information through two types of surveys sponsored by the National Energy Use Database (NEUD) – stock surveys and flow surveys. Stock surveys have two main goals. First, they collect information on the characteristics of energy-using appliances and equipment, the state of dwellings and building stock, and the profile of consumers (including consumption habits). Second, they collect data on annual energy consumption by households. Flow surveys gather information on variables affecting housing stock, such as the characteristics of new equipment and new housing, and retrofit activities. For more information on surveys conducted by NEUD, visit its Web site at: *oee.nrcan.gc.ca/statistics/publications*.

The Office of Energy Efficiency (OEE) has also developed the Residential End-Use Model (REUM). This stock accounting model assesses trends in energy use in the Canadian residential sector. It is disaggregated at the provincial level and includes five end-uses (space heating, water heating, appliances, lighting and space cooling), some of which are further disaggregated at the level of equipment or energy sources.

To estimate end-use energy use, REUM allocates the energy use reported in RESD to the five end-uses by using annual stock characteristics and sales data, coupled with demand loads and unit energy consumption for equipment stock.

By combining data from the HFE survey with data from the SHS, REUM estimates data on housing stock by province, building type and vintage. The OEE estimates data on floor space by combining REUM's housing stock estimates with data on floor space from two other surveys: the *Building Permits Survey* and the OEE-sponsored 1993 and 1997 *Survey of Household Energy Use* (SHEU), both conducted by Statistics Canada. NEUD is currently in the process of updating the information collected through SHEU for the 2003 reporting year. Field data collection occurred in the spring of 2004 and preliminary data are expected in 2005.

REUM estimates data on residential equipment stock by using data from Statistics Canada's stock surveys and other industry surveys. The data on demand load and unit energy consumption comes from various studies, some conducted at the request of NRCan.

This year, new data from the SHS micro-data file allowed us to update our previous estimates of energy sources for water heating. The historical series has been revised to take into account this new information. Heat loss assumptions that impact on the energy consumed to heat and cool houses were also revisited.

The model also takes into account the influence of weather on residential energy demand. It uses the number of heating degree-days in *Monthly Summary of Degree-Days below 18.0°C* and the number of cooling degree-days in *Monthly Summary of Degree-Days above 18.0°C*, two reports from Environment Canada.

The residential prices of heating oil and natural gas are weighted averages of regional prices from Statistics Canada's *Energy Statistics Handbook* (Cat. No. 57-601-XIE). The residential price of electricity is a weighted average of the data found in Hydro-Quebec's *Comparison of Electricity Prices in Major North American Cities*.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Residential Secondary Energy Use by Energy Source and End-Use

	1990	1991–1996	1997	1998
Total Energy Use (PJ) [a,b]	1,289.3		1,394.1	1,270.1
Energy Use by Energy Source (PJ) [a,b]				
Electricity	467.4		484.2	465.6
Natural Gas	528.4		648.1	577.8
Heating Oil	186.4		147.1	126.1
Other [1]	21.9		15.8	14.1
Wood	85.3		99.0	86.6
Energy Use by End-Use (PJ) [a]				
Space Heating	781.6		858.4	738.2
Water Heating	269.8		290.4	285.1
Appliances	176.4		179.5	176.0
Major Appliances	*132.1*		*121.1*	*117.3*
Other Appliances [2]	*44.4*		*58.4*	*58.8*
Lighting	53.2		56.4	56.3
Space Cooling	8.3		9.4	14.4
Activity				
Total Floor Space (million m²) [c]	1,195		1,401	1,425
Total Households (thousands) [c,c]	9,895		11,224	11,385
Energy Intensity (GJ/m²) [a,b]	1.08		1.00	0.89
Energy Intensity (GJ/household) [a,b,c]	130.3		124.2	111.6
Heating Degree-Day Index [b,d]	0.92		0.98	0.84
Cooling Degree-Day Index [b,e]	1.06		0.93	1.29

1991–1996 data available at oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.
2) "Other Appliances" includes small appliances such as televisions, video cassette recorders, digital video disc players, radios, computers and toasters.

Sources:
a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) Statistics Canada, *Survey of Household Spending in 1997-2003*, Ottawa, December 2004 (Cat. No. 62F0041).
d) Environment Canada, Atmospheric Environment Service, *Monthly Summary of Degree-Days below 18.0°C*, Toronto, 1990-2003.
e) Environment Canada, Atmospheric Environment Service, *Monthly Summary of Degree-Days above 18.0°C*, Toronto, 1990-2003.

1999	2000	2001	2002	2003	Total Growth 1990–2003
1,325.5	**1,391.9**	**1,338.2**	**1,390.8**	**1,457.6**	**13.0%**
479.8	497.6	504.9	517.5	542.9	16.2%
609.3	644.8	601.0	640.2	670.2	26.8%
131.0	132.4	121.1	116.5	122.8	-34.1%
12.2	13.0	13.1	12.4	12.2	-44.4%
93.3	104.0	98.3	104.1	109.5	28.4%
783.5	845.5	781.1	824.4	873.4	11.7%
290.4	294.2	293.1	299.7	311.8	15.6%
176.9	180.8	183.8	182.1	189.0	7.1%
116.0	*116.8*	*117.0*	*114.1*	*116.8*	*-11.5%*
60.9	*64.0*	*66.8*	*67.9*	*72.2*	*62.8%*
57.8	60.2	62.0	62.1	65.6	23.4%
17.0	11.2	18.3	22.4	17.7	112.8%
1,448	1,474	1,498	1,516	1,545	29.3%
11,553	11,728	11,897	12,021	12,214	23.4%
0.92	**0.94**	**0.89**	**0.92**	**0.94**	**-12.6%**
114.7	**118.7**	**112.5**	**115.7**	**119.3**	**-8.4%**
0.88	**0.96**	**0.88**	**0.94**	**0.97**	
1.54	**0.90**	**1.43**	**1.71**	**1.31**	

Residential GHG Emissions by Energy Source and End-Use – Including and Excluding Electricity-Related Emissions

	1990	1991–1996	1997	1998
Total GHG Emissions Including Electricity (Mt) [a,b,c]	69.5		72.7	69.5
GHG Emissions by Energy Source (Mt) [a,b,c]				
Electricity	26.3		26.7	29.0
Natural Gas	26.6		32.3	28.8
Heating Oil	13.7		10.8	9.2
Other [1]	1.4		1.0	0.9
Wood	1.6		1.8	1.6
GHG Emissions by End-Use (Mt) [a,c]				
Space Heating	41.5		43.8	38.4
Water Heating	14.7		15.4	15.8
Appliances	9.9		9.9	10.9
Major Appliances	*7.4*		*6.7*	*7.2*
Other Appliances [2]	*2.5*		*3.2*	*3.7*
Lighting	3.0		3.1	3.5
Space Cooling	0.5		0.5	0.9
GHG Intensity (tonne/TJ) [a,b,c]	53.9		52.1	54.7
Total GHG Emissions Excluding Electricity (Mt) [a,b,c]	43.2		46.0	40.5
GHG Emissions by End-Use (Mt) [a,c]				
Space Heating	34.4		35.9	30.7
Water Heating	8.7		9.9	9.6
Appliances	0.2		0.2	0.2
Major Appliances	*0.2*		*0.2*	*0.2*
Other Appliances [2]	*0.0*		*0.0*	*0.0*
Lighting	0.0		0.0	0.0
Space Cooling	0.0		0.0	0.0
GHG Intensity (tonne/TJ) [a,b,c]	33.5		33.0	31.9

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.
2) "Other Appliances" includes small appliances such as televisions, video cassette recorders, digital video disc players, radios, computers and toasters.

Sources:
a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
c) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990-2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
71.1	**75.8**	**74.2**	**74.9**	**79.8**	**14.8%**
28.6	31.1	32.7	31.6	34.6	31.8%
30.4	32.3	30.0	32.0	33.4	25.4%
9.6	9.7	8.9	8.5	9.0	-34.3%
0.8	0.8	0.8	0.8	0.8	-43.7%
1.7	1.9	1.8	1.9	2.0	28.4%
40.3	43.8	40.7	42.1	45.1	8.7%
15.8	16.3	16.5	16.5	17.4	18.5%
10.5	11.2	11.8	11.1	12.0	21.1%
6.9	*7.2*	*7.5*	*6.9*	*7.4*	*-0.3%*
3.6	*4.0*	*4.3*	*4.2*	*4.6*	*84.7%*
3.4	3.8	4.0	3.8	4.2	40.0%
1.0	0.7	1.2	1.4	1.1	141.4%
53.6	**54.5**	**55.5**	**53.8**	**54.7**	**1.5%**
42.5	**44.7**	**41.5**	**43.2**	**45.2**	**4.4%**
32.5	34.7	31.6	33.1	34.7	0.9%
9.8	9.9	9.7	9.9	10.2	17.6%
0.2	0.2	0.2	0.2	0.3	37.9%
0.2	*0.2*	*0.2*	*0.2*	*0.3*	*37.9%*
0.0	*0.0*	*0.0*	*0.0*	*0.0*	–
0.0	0.0	0.0	0.0	0.0	–
0.0	0.0	0.0	0.0	0.0	–
32.1	**32.1**	**31.0**	**31.1**	**31.0**	**-7.6%**

Residential Housing Stock and Floor Space

	1990	1991–1996	1997	1998
Total Housing Stock (thousands) [a]	**10,410**		**11,869**	**12,027**
Housing Stock by Building Type (thousands)				
Single Detached	5,865		6,743	6,845
Single Attached	929		1,235	1,264
Apartments	3,394		3,646	3,666
Mobile Homes	222		245	253
Housing Stock by Vintage (thousands)				
Before 1946	2,064		1,968	1,958
1946–1960	1,364		1,329	1,326
1961–1977	3,632		3,524	3,513
1978–1983	1,600		1,580	1,577
1984–1995	1,751		3,048	3,047
1996–2003 [1]	0		419	606
Total Floor Space (million m²) [a]	**1,195**		**1,401**	**1,425**
Floor Space by Building Type (million m²)				
Single Detached	782		926	943
Single Attached	106		141	145
Apartments	287		311	313
Mobile Homes	20		23	23
Floor Space by Vintage (million m²)				
Before 1946	235		225	224
1946–1960	139		136	136
1961–1977	397		386	385
1978–1983	195		193	192
1984–1995	229		402	402
1996–2003 [1]	0		58	85

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Growth rate shown in the final column entitled "Total Growth 1990–2003" is for the period 1996 to 2003.

Source:
a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
12,185	**12,350**	**12,517**	**12,632**	**12,820**	**23.2%**
6,956	7,083	7,171	7,226	7,354	25.4%
1,271	1,292	1,323	1,334	1,351	45.4%
3,694	3,711	3,757	3,807	3,842	13.2%
264	264	266	265	273	23.2%
1,947	1,940	1,933	1,889	1,869	-9.4%
1,321	1,318	1,315	1,299	1,290	-5.4%
3,495	3,479	3,469	3,429	3,406	-6.2%
1,573	1,570	1,568	1,559	1,555	-2.8%
3,044	3,042	3,041	3,033	3,027	72.9%
805	1,002	1,192	1,423	1,672	724.1%
1,448	**1,474**	**1,498**	**1,516**	**1,545**	**29.3%**
962	984	999	1,011	1,033	32.1%
146	149	153	155	157	48.7%
315	317	321	326	329	14.6%
25	25	25	25	26	29.7%
223	222	221	216	214	-8.9%
135	135	135	133	132	-5.1%
384	382	381	377	375	-5.5%
192	192	192	191	190	-2.4%
402	402	402	401	400	74.4%
113	142	168	199	234	737.7%

continued ——▾

Residential Housing Stock and Floor Space *(continued)*

	1990	1991–1996	1997	1998
Average Size of Housing Unit (m^2/house) [a]	**115**		**118**	**118**
Average Size by Building Type (m^2/house)				
Single Detached	133		137	138
Single Attached	114		114	115
Apartments	85		85	85
Mobile Homes	90		92	93
Average Size by Vintage (m^2/house)				
Before 1946	114		114	114
1946–1960	102		102	102
1961–1977	109		110	110
1978–1983	122		122	122
1984–1995	131		132	132
1996–2003 [1]	0		139	140

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Growth rate shown in the final column entitled "Total Growth 1990–2003" is for the period 1996 to 2003.

Source:
a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.

continued

1999	2000	2001	2002	2003	Total Growth 1990–2003
119	**119**	**120**	**120**	**121**	**5.0%**
138	139	139	140	141	5.3%
115	115	116	116	116	2.3%
85	85	85	86	86	1.2%
93	93	94	94	94	5.3%
114	115	115	114	115	0.5%
102	102	102	102	102	0.3%
110	110	110	110	110	0.7%
122	122	122	122	122	0.4%
132	132	132	132	132	0.9%
140	141	141	140	140	1.6%

Residential Space Heating Energy Use by Energy Source, Building Type and Vintage

	1990	1991–1996	1997	1998
Total Space Heating Energy Use (PJ) [a]	**781.6**		**858.4**	**738.2**
Energy Use by Energy Source (PJ) [a]				
Electricity	125.8		143.4	124.5
Natural Gas	384.8		469.4	403.0
Heating Oil	167.4		132.8	112.0
Other [1]	18.6		14.4	12.7
Wood	85.0		98.4	86.0
Energy Use by Building Type (PJ) [a]				
Single Detached	595.4		657.3	564.4
Single Attached	57.8		72.8	61.6
Apartments	108.6		109.2	94.7
Mobile Homes	19.7		19.1	17.5
Energy Use by Vintage (PJ) [a]				
Before 1946	230.6		224.2	184.3
1946–1960	104.8		102.8	87.0
1961–1977	240.2		234.9	201.6
1978–1983	112.3		112.9	97.8
1984–1995	93.7		160.7	137.6
1996–2003 [1]	0.0		23.1	29.6
Activity				
Total Floor Space (million m^2) [a]	1,195		1,401	1,425
Energy Intensity (GJ/m^2) [a]	**0.65**		**0.61**	**0.52**
Heat Gains (PJ) [a]	**90.8**		**99.9**	**84.2**
Heating Degree-Day Index [a,b]	**0.92**		**0.98**	**0.84**

1) "Other" includes coal and propane.
2) Growth rate shown in the final column entitled "Total Growth 1990–2003" is for the period 1996 to 2003.

1991–1996 data available at oee.nrcan.gc.ca/handbook05

Sources:
a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
b) Environment Canada, Atmospheric Environment Service, *Monthly Summary of Degree-Days below 18.0°C*, Toronto, 1990–2003.

1999	2000	2001	2002	2003	Total Growth 1990–2003
783.5	845.5	781.1	824.4	873.4	11.7%
137.0	146.2	139.2	147.5	162.3	29.0%
431.2	465.4	424.6	456.0	481.2	25.0%
116.4	118.6	107.7	104.0	109.8	-34.4%
11.1	11.9	12.0	11.5	11.4	-38.7%
92.7	103.4	97.6	103.3	108.8	28.0%
600.1	650.1	597.8	631.7	667.5	12.1%
65.3	70.1	65.8	69.1	73.8	27.7%
99.9	105.7	99.3	104.7	112.6	3.7%
18.2	19.5	18.2	18.9	19.5	-1.5%
194.3	207.8	188.9	194.1	204.2	-11.5%
91.3	97.1	88.8	92.1	95.7	-8.7%
210.1	222.9	203.4	211.5	218.6	-9.0%
101.7	108.4	98.5	103.8	107.3	-4.4%
145.2	154.3	142.2	149.0	156.6	67.1%
40.9	55.0	59.2	73.9	91.0	641.9%
1,440	1,474	1,498	1,516	1,545	29.3%
0.54	0.57	0.52	0.54	0.57	-13.6%
89.3	99.8	93.4	99.2	106.4	17.2%
0.88	0.96	0.85	0.94	0.97	

Residential Space Heating System Stock Share

	1990	1991 - 1996	1997	1998
Heating System Stock Share by System Type (%) [a]				
Heating Oil - Normal Efficiency	14.2		9.1	8.4
Heating Oil - Medium Efficiency	0.2		1.8	2.6
Heating Oil - High Efficiency	0.0		0.0	0.0
Natural Gas - Normal Efficiency	41.1		33.7	32.3
Natural Gas - Medium Efficiency	1.0		8.1	9.1
Natural Gas - High Efficiency	2.1		4.8	5.1
Electric Baseboard	28.0		28.6	28.3
Heat Pump	2.1		2.5	3.1
Other [1]	0.8		1.2	1.2
Wood	1.6		1.8	1.7
Dual Systems				
Wood/Electric	5.2		4.9	4.9
Wood/Heating Oil	2.4		2.3	2.3
Natural Gas/Electric	0.3		0.4	0.4
Heating Oil/Electric	0.8		1.0	1.1

1) "Other" includes coal and propane.

1991-1996 data available at oee.nrcan.gc.ca/handbook05

Source:
a) Natural Resources Canada, Residential End Use Model, Ottawa, February 2005

1999	2000	2001	2002	2003
7.9	7.5	7.3	7.0	6.8
2.1	2.3	2.5	2.7	2.8
0.0	0.0	0.0	0.0	0.0
31.1	29.9	28.6	27.0	25.5
10.1	11.1	12.0	12.9	13.6
5.5	5.9	6.4	7.1	8.1
28.1	27.9	27.6	27.5	27.4
3.1	3.2	3.4	3.6	3.7
1.2	1.2	1.2	1.3	1.3
1.9	2.0	2.0	2.0	2.0
5.0	5.0	5.0	5.0	5.1
2.3	2.4	2.4	2.4	2.4
0.4	0.4	0.4	0.5	0.5
1.1	1.1	1.2	1.2	1.2

Residential Lighting and Space Cooling Details

	1990	1991–1996	1997	1998
Total Lighting Energy Use[1] (PJ)	53.2		56.4	56.3
Activity				
Total Floor Space (million m²)	1,195		1,401	1,425
Energy Intensity (MJ/m²)	44.5		40.3	39.5
Heat Loss (PJ)	22.3		25.3	21.6
Total Space Cooling Energy Use[1] (PJ)	8.3		9.4	14.4
Energy Use by Cooling System Type (PJ)				
Room	2.0		1.8	2.5
Central	6.4		7.7	11.9
Activity				
Floor Space (million m²)	308		458	484
Energy Intensity (MJ/m²)	27.0		20.6	29.8
Cooling Degree-Day Index	1.06		0.93	1.29
Total Cooling System Stock (thousands)	2,466		3,540	3,735
System Stock by Cooling System Type (thousands)				
Room	1,090		1,366	1,419
Central	1,376		2,174	2,316
Cooling System New Unit Efficiencies				
Room (EER)	7.1		9.4	9.4
Central (SEER)	9.1		10.3	10.3
Cooling System Stock Efficiencies				
Room (EER)	6.6		7.8	7.9
Central (SEER)	8.6		9.4	9.5

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Lighting and space cooling consume only electricity.

Sources:

a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.

b) Environment Canada, Atmospheric Environment Service, *Monthly Summary of Degree-Days above 18.0°C*, Toronto, 1990–2003.

1999	2000	2001	2002	2003	Total Growth 1990–2003
57.8	60.2	62.0	62.1	65.6	23.4%
1,448	1,474	1,498	1,516	1,545	29.3%
39.9	40.8	41.4	41.0	42.5	-4.6%
23.2	26.3	25.0	26.6	28.9	29.6%
17.0	11.2	18.3	22.4	17.7	112.8%
3.0	1.9	3.1	3.6	3.0	55.4%
14.0	9.3	15.2	18.8	14.7	130.4%
511	536	563	584	605	95.2%
33.3	20.9	32.5	38.4	29.2	8.4%
1.54	0.90	1.43	1.71	1.31	
3,937	4,119	4,321	4,493	4,647	88.4%
1,488	1,539	1,602	1,653	1,728	58.5%
2,449	2,580	2,720	2,840	2,919	112.1%
9.4	9.4	9.4	9.4	9.4	31.5%
10.3	10.3	10.3	10.3	10.3	12.7%
8.1	8.3	8.4	8.6	8.8	28.0%
9.6	9.7	9.8	9.9	10.0	15.7%

Residential Appliance Details

	1990	1991 - 1996	1997	1998
Total Appliance Energy Use (PJ)*	176.4		179.5	176.0
Energy Use by Energy Source (PJ)*				
Electricity	172.8		175.2	171.7
Natural Gas	3.7		4.2	4.3
Energy Use by Appliance Type (PJ)*				
Refrigerator	53.1		43.5	41.2
Freezer	21.5		18.0	16.7
Dishwasher[1]	1.5		1.5	1.5
Clothes Washer[1]	2.4		2.4	2.3
Clothes Dryer	28.8		28.9	28.7
Range	24.8		26.9	26.8
Other Appliances[2]	44.4		58.4	58.8
Activity				
Total Households (thousands)**	9,895		11,224	11,385
Energy Intensity (GJ/household)**	17.8		16.0	15.5
Heat Loss by Appliance Type (PJ)*				
Refrigerator	22.5		19.7	15.9
Freezer	9.2		8.2	6.6
Dishwasher[1]	0.2		0.2	0.2
Clothes Washer[1]	0.6		0.6	0.5
Clothes Dryer	3.4		3.7	3.1
Range	8.7		10.1	8.6
Other Appliances[2]	18.8		26.4	22.7
Appliances per Household by Appliance Type**				
Refrigerator	1.18		1.22	1.22
Freezer	0.57		0.59	0.59
Dishwasher	0.42		0.49	0.51
Clothes Washer	0.75		0.81	0.81
Clothes Dryer	0.73		0.80	0.82
Range	0.98		0.99	0.99

1991-1996 data available at oee.nrcan.gc.ca/handbook05

1) Excludes hot water requirements.
2) "Other Appliances" includes small appliances such as televisions, video cassette recorders, digital video disc players, radios, computers and toasters.

Sources:
a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
b) Statistics Canada, *Survey of Household Spending in 1997, 2003*, Ottawa, December 2004 (Cat. No. 62F0041).

1999	2000	2001	2002	2003	Total Growth 1990–2003
176.9	180.8	183.8	182.1	189.0	7.1%
172.7	176.5	179.4	177.5	183.9	6.5%
4.2	4.3	4.4	4.6	5.2	39.4%
40.7	39.9	39.2	37.7	37.8	-28.9%
15.7	15.3	14.7	13.6	13.1	-39.0%
1.4	1.5	1.5	1.5	1.5	-3.0%
2.3	2.4	2.4	2.3	2.4	0.1%
28.5	29.4	30.1	29.6	30.9	7.3%
27.4	28.4	29.2	29.5	31.2	26.0%
60.9	64.0	66.8	67.9	72.2	62.6%
11,553	11,728	11,897	12,021	12,214	23.4%
15.3	**15.4**	**15.4**	**15.1**	**15.5**	**-13.2%**
16.5	17.6	15.9	16.3	16.8	-25.2%
6.4	6.8	6.0	6.0	5.9	-35.8%
0.2	0.2	0.2	0.2	0.2	1.4%
0.5	0.6	0.5	0.6	0.6	5.4%
3.2	3.6	3.4	3.6	3.9	12.7%
9.3	10.4	9.9	10.6	11.5	32.0%
24.7	28.3	27.1	29.4	32.1	70.9%
1.24	1.22	1.23	1.24	1.24	5.2%
0.58	0.58	0.58	0.57	0.56	-1.0%
0.49	0.51	0.52	0.54	0.55	31.2%
0.80	0.81	0.81	0.81	0.81	8.9%
0.80	0.81	0.82	0.81	0.82	11.9%
0.99	0.99	0.99	0.99	0.99	1.1%

Residential Appliance Unit Energy Consumption (UEC)

	1990	1991–1996	1997	1998
UEC[1] for New Electric Appliances (kWh/year)[2]				
Refrigerator	956		657	654
Freezer	714		376	381
Dishwasher[1]	101		64	64
Clothes Washer[1]	97		74	72
Clothes Dryer	1,103		887	900
Range	772		772	771
UEC[1] for New Natural Gas Appliances (kWh/year)[2]				
Clothes Dryer	925		880	880
Range	1,357		1,226	1,226
UEC[1] for Stock of Electric Appliances (kWh/year)[2]				
Refrigerator	1,525		1,105	1,047
Freezer	1,291		948	886
Dishwasher[1]	125		95	91
Clothes Washer[1]	106		92	89
Clothes Dryer	1,314		1,112	1,087
Range	802		787	785
UEC[1] for Stock of Natural Gas Appliances (kWh/year)[2]				
Clothes Dryer	1,468		1,010	979
Range	1,534		1,387	1,364

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Unit energy consumption is based on rated efficiency.
2) Excludes hot water requirements.

Sources:

a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
b) Special Tabulations from *Energy Consumption of Major Household Appliances Shipped in Canada — Trends for 1990–2003*, Ottawa, December 2004.

1999	2000	2001	2002	2003	Total Growth 1990–2003
645	640	559	506	487	-49.1%
380	391	393	368	369	-48.3%
63	63	62	58	52	-48.9%
69	67	65	62	57	-41.8%
908	910	916	916	914	-17.1%
759	760	763	756	718	-7.0%
880	880	880	880	880	-4.9%
1,226	1,226	1,226	1,226	1,226	-9.7%
993	945	896	846	801	-47.5%
825	767	713	661	614	-52.5%
87	83	80	76	72	-42.7%
87	84	82	79	76	-28.5%
1,060	1,042	1,022	1,004	988	-24.8%
782	780	777	774	769	-4.1%
955	938	925	914	906	-38.3%
1,344	1,326	1,311	1,297	1,283	-16.4%

Residential Water Heating Energy Use and Water Heater Stock Share

	1990	1991–1996	1997	1998
Total Water Heating Energy Use (PJ)*	289.8		290.4	285.1
Energy Use by Energy Source (PJ)*				
Electricity	107.3		99.7	98.5
Natural Gas	139.9		174.4	170.5
Heating Oil	18.9		14.2	14.1
Other[1]	3.3		1.5	1.4
Wood	0.3		0.6	0.6
Activity				
Total Households (thousands)[1]**	9,895		11,224	11,385
Energy Intensity (GJ/household)**	27.3		25.9	25.0
Water Heater Stock Market Shares (%)*				
Electricity	55.0		51.2	51.0
Natural Gas	39.8		44.3	44.5
Heating Oil	4.6		4.0	3.9
Other[1]	0.5		0.4	0.4
Wood	0.1		0.1	0.1
Heat Loss (PJ)*	5.0		5.7	4.9

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.

Sources:
a) Natural Resources Canada, Residential End-Use Model, Ottawa, February 2005.
b) Statistics Canada, *Survey of Household Spending in 1997–2003*, Ottawa, December 2004 (Cat. No. 62F0041).

1999	2000	2001	2002	2003	Total Growth 1990–2003
290.4	**294.2**	**293.1**	**299.7**	**311.8**	**15.6%**
100.3	103.6	105.9	108.0	113.4	5.7%
173.8	175.1	172.0	177.6	183.9	31.4%
14.6	13.8	13.4	12.6	13.0	-31.5%
1.1	1.0	1.1	0.9	0.8	-75.7%
0.6	0.7	0.7	0.8	0.8	165.0%
11,553	11,728	11,897	12,021	12,214	23.4%
25.1	**25.1**	**24.6**	**24.9**	**25.5**	**-6.4%**
50.8	50.9	51.2	51.5	51.3	
44.7	44.7	44.5	44.2	44.4	
3.9	3.9	3.9	3.9	3.9	
0.4	0.3	0.3	0.3	0.2	
0.2	0.2	0.2	0.2	0.2	
5.3	**5.9**	**5.4**	**5.9**	**6.3**	**27.5%**

Residential Energy Prices and Background Indicators

	1990	1991–1996	1997	1998
Energy Prices by Energy Source (incl. taxes)				
Natural Gas (cents/m³)[a,c]	19.1		23.6	25.1
Heating Oil (cents/litre)[a,d,e]	35.6		41.0	36.7
Electricity (cents/kWh)[a,c]	6.2		8.0	8.1
Background Indicators				
Consumer Price Index (1992 = 100)[c]				
Natural Gas	87.8		112.2	119.1
Fuel Oil and Other Fuels	96.0		112.3	100.8
Electricity	82.1		106.8	107.8
Real Personal Disposable Income per Household ($97)[c]	*52,583*		*48,642*	*49,270*
Total Population (thousands)[f]	*27,698*		*29,907*	*30,157*

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Energy Statistics Handbook*, Ottawa, August 2004 (Cat. No. 57-601-XIE).
b) Calculated based on Hydro-Québec's *Comparison of Electricity Prices in Major North American Cities*, May 2003.
c) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.
d) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
e) Statistics Canada, *Total Population, Census Divisions and Census Metropolitan Areas*, Tables 051-0014 and 051-0034, Ottawa, December 2004 (CANSIM).
f) Statistics Canada, *Estimates of Population, by Age Group and Sex, Provinces and Territories*, Table 051-0001, Ottawa, February 2005 (CANSIM).

1999	2000	2001	2002	2003	Total Growth 1990–2003
27.3	31.9	44.6	36.6	46.9	145.8%
37.2	53.6	53.5	49.8	57.2	60.7%
8.1	7.9	8.1	8.5	8.6	39.0%
130.7	158.9	206.0	168.7	219.5	
101.2	143.2	143.5	131.8	151.5	
108.5	109.2	111.1	119.6	117.2	
50,123	***51,974***	***52,536***	***52,751***	***52,851***	***0.5%***
30,404	***30,689***	***31,021***	***31,373***	***31,660***	***14.3%***

Chapter 3
Commercial/Institutional Sector

The Data Situation

Of the six sectors of the economy reviewed in this handbook, the commercial/institutional sector has the most significant limitations with regard to available data.

Energy use data used in this handbook for the commercial/institutional sector are reported in Statistics Canada's *Report on Energy Supply-Demand in Canada* (Cat. No. 57-003-XIB), under the categories of "public administration" and "commercial and other institutional." Statistics Canada (SC) defines these categories as final consumers not reported in the other end-use sectors. Therefore, energy use data for the commercial/institutional sector are essentially the energy use not accounted for in the residential, industrial, transportation and agriculture sectors.

The Office of Energy Efficiency (OEE) developed the Commercial/Institutional End-Use Model (CEUM) to assess Canadian energy use trends in this sector. CEUM uses estimates of energy intensity to allocate energy use to various end-uses. These intensity estimates are partially based on the *Commercial and Institutional Building Energy Use Survey* (CIBEUS) conducted in 2001 by SC and funded by the OEE, which collected data for the 2000 calendar year. A new survey of energy use in the commercial/institutional sector, based on the North American Industry Classification System (NAICS), is presently being conducted. Results from this survey for the reporting year 2004 are expected in 2005. As with CIBEUS, this survey will be conducted by SC for the OEE.

CEUM also uses estimates of floor space, developed by Informetrica Limited for the OEE. This year, as requested by the OEE, in order to be compatible with energy use data, Informetrica reviewed its methodology and produced estimates of floor space based on NAICS. These estimates are calculated using average costs per unit of floor space, investment flows for new construction, as well as employment and gross domestic product data. For this reason, in this handbook, floor space data are reported for ten activity types instead of the nine building types reported in previous years.

A penetration rate for air conditioners was estimated using data from CIBEUS in order to determine the proportion of air conditioned floor space. This is used to calculate the energy intensity related to space cooling where only the air conditioned floor space is taken into consideration.

The model takes into account the influence of weather on commercial/institutional energy demand. It uses the number of heating degree-days and the number of cooling degree-days from two reports from Environment Canada, *Monthly Summary of Degree-Days below 18.0°C* and *Monthly Summary of Degree-Days above 18.0°C*, respectively.

The commercial/institutional price of heating oil and natural gas comes from Statistics Canada's *Energy Statistics Handbook* (Cat. No. 57-601-XIE). The commercial/institutional price of electricity is a weighted average of the data found in Hydro-Québec's *Comparison of Electricity Prices in Major North American Cities*.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Commercial/Institutional Secondary Energy Use by Energy Source, End-Use and Activity Type

	1990	1991–1996	1997	1998
Total Energy Use (PJ) [a]	867.0		998.5	944.1
Energy Use by Energy Source (PJ) [a]				
Electricity	390.1		436.6	431.3
Natural Gas	387.1		452.7	418.5
Light Fuel Oil and Kerosene	62.0		57.5	47.6
Heavy Fuel Oil	11.4		11.8	16.8
Steam	0.2		0.6	0.3
Other [1]	16.3		39.3	29.5
Energy Use by End-Use (PJ) [a,2]				
Space Heating	447.3		525.9	467.9
Water Heating	51.1		63.1	60.6
Auxiliary Equipment	84.7		91.8	90.3
Auxiliary Motors	102.5		112.2	109.5
Lighting	134.5		153.4	148.6
Space Cooling	38.0		44.5	59.8
Street Lighting	8.9		7.4	7.5
Energy Use by Activity Type [2] ***(PJ)*** [a]				
Wholesale Trade	53.3		55.9	53.3
Retail Trade	129.2		137.0	131.6
Transportation and Warehousing	32.7		34.2	31.0
Information and Cultural Industries	24.1		29.8	28.2
Offices [3]	336.7		402.2	379.6
Educational Services	78.2		94.0	86.5
Health Care and Social Assistance	106.2		121.5	115.1
Arts, Entertainment and Recreation	23.2		30.8	28.5
Accommodation and Food Services	54.9		64.1	63.0
Other Services	19.5		21.5	19.9
Activity				
Total Floor Space (million m^2) [c]	438.9		491.3	498.3
Energy Intensity [2] **(GJ/m^2)** [a,c]	1.96		2.02	1.88
Heating Degree-Day Index [a,d]	0.92		0.98	0.84
Cooling Degree-Day Index [a,e]	1.06		0.93	1.29

1991–1996 data available at oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.
2) Excludes street lighting.
3) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; and public administration.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
c) Informetrica Limited, Estimates of Commercial Floor Space, 2003 Database Update, Ottawa, October 2004. Data for 2003 adjusted by Natural Resources Canada.
d) Environment Canada, Atmospheric Environment Service, *Monthly Summary of Degree-Days below 18.0°C*, Toronto, 1990–2003.
e) Environment Canada, Atmospheric Environment Service, *Monthly Summary of Degree-Days above 18.0°C*, Toronto, 1990–2003.
f) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
979.2	1,072.8	1,060.9	1,131.5	1,180.9	36.2%
436.8	453.0	445.2	476.8	473.6	21.4%
443.8	503.2	488.4	517.2	525.2	35.7%
47.0	60.4	63.6	73.9	80.1	29.3%
17.0	19.8	26.8	27.4	69.1	508.1%
0.3	0.3	0.3	0.3	0.3	68.5%
34.3	36.1	36.6	35.9	32.6	100.3%
502.2	573.6	561.8	593.3	644.0	44.0%
63.5	68.5	70.3	70.8	76.2	49.0%
88.9	98.5	96.1	98.4	106.1	25.3%
107.7	116.2	109.5	114.8	114.1	11.3%
145.9	160.9	149.9	158.1	158.1	17.6%
63.4	47.4	65.6	87.4	73.4	93.2%
7.4	7.7	7.7	8.7	9.0	0.6%
53.3	56.9	56.7	59.3	58.8	10.2%
133.7	141.4	141.2	152.4	157.4	21.8%
31.1	34.6	33.3	34.0	36.9	12.9%
28.9	32.8	32.1	34.1	35.0	45.0%
402.2	448.6	445.9	477.1	497.7	47.8%
89.2	101.2	96.2	102.4	117.8	50.7%
119.0	127.9	123.6	132.9	135.2	27.3%
29.3	32.6	32.2	33.7	34.8	49.9%
64.5	66.5	69.6	74.1	74.3	35.3%
20.5	22.4	22.4	22.9	24.0	23.2%
506.0	513.3	520.2	528.2	547.8	24.8%
1.92	2.08	2.02	2.13	2.14	9.4%
0.88	0.96	0.88	0.94	0.97	
1.54	0.90	1.43	1.71	1.31	

Commercial/Institutional GHG Emissions by Energy Source, End-Use and Activity Type – Including Electricity-Related Emissions

	1990	1991–1996	1997	1998
Total GHG Emissions Including Electricity (Mt)[a,c]	47.8		54.2	54.2
GHG Emissions by Energy Source (Mt)[a,c]				
Electricity	21.9		24.1	26.8
Natural Gas	19.5		22.6	20.9
Light Fuel Oil and Kerosene	4.6		4.2	3.5
Heavy Fuel Oil	0.8		0.9	1.2
Steam	0.0		0.0	0.0
Other[1]	1.0		2.4	1.8
GHG Emissions by End-Use (Mt)[b,c]				
Space Heating	24.3		28.1	25.1
Water Heating	2.8		3.4	3.3
Auxiliary Equipment	4.8		5.1	5.6
Auxiliary Motors	5.8		6.2	6.8
Lighting	7.6		8.5	9.2
Space Cooling	2.1		2.4	3.6
Street Lighting	0.5		0.4	0.5
GHG Emissions by Activity Type[2] (Mt)[b,c]				
Wholesale Trade	2.9		3.0	3.1
Retail Trade	7.1		7.4	7.6
Transportation and Warehousing	1.8		1.9	1.8
Information and Cultural Industries	1.3		1.6	1.6
Offices[3]	18.5		21.7	21.7
Educational Services	4.4		5.2	4.9
Health Care and Social Assistance	5.9		6.7	6.6
Arts, Entertainment and Recreation	1.3		1.7	1.6
Accommodation and Food Services	3.0		3.5	3.7
Other Services	1.1		1.2	1.1
GHG Intensity (tonne/TJ)[a,c]	55.2		54.2	57.4

1991–1996 data available at oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.
2) Excludes street lighting.
3) "Offices" includes activities related to finance and insurance, real estate and rental and leasing, professional, scientific and technical services, and public administration.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
c) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.
d) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
55.0	61.6	62.1	64.6	69.3	44.9%
26.0	28.3	28.8	29.2	30.2	37.7%
22.1	25.2	24.4	25.8	26.2	34.2%
3.5	4.4	4.7	5.4	5.9	28.8%
1.2	1.4	2.0	2.0	5.1	497.4%
0.0	0.0	0.0	0.0	0.0	–
2.1	2.2	2.2	2.2	2.0	101.0%
26.9	31.0	30.7	32.2	35.8	47.6%
3.5	3.8	3.9	3.9	4.3	50.9%
5.3	6.1	6.2	6.0	6.8	41.8%
6.4	7.3	7.1	7.0	7.3	26.3%
8.7	10.0	9.7	9.7	10.1	33.4%
3.7	2.9	4.1	5.2	4.5	111.3%
0.4	0.5	0.5	0.5	0.6	14.2%
3.0	3.3	3.4	3.4	3.5	18.3%
7.5	8.2	8.4	8.7	9.3	30.5%
1.7	2.0	1.9	1.9	2.2	20.3%
1.6	1.9	1.9	2.0	2.1	54.7%
22.5	25.6	25.9	27.0	28.9	56.6%
5.0	5.8	5.6	5.8	6.9	57.9%
6.7	7.3	7.2	7.6	8.0	34.9%
1.7	1.9	1.9	2.0	2.1	61.9%
3.7	3.9	4.2	4.3	4.5	46.9%
1.1	1.3	1.3	1.3	1.4	29.3%
56.1	57.4	58.5	57.1	58.7	6.4%

Commercial/Institutional GHG Emissions by End-Use and Activity Type – Excluding Electricity-Related Emissions

	1990	1991–1996	1997	1998
Total GHG Emissions Excluding Electricity (Mt)[a,d]	25.9		30.1	27.4
GHG Emissions by End-Use (Mt)[b,c,d]				
Space Heating	22.8		26.0	23.4
Water Heating	2.5		3.2	3.0
Auxiliary Equipment	0.5		0.7	0.6
Auxiliary Motors	0.0		0.0	0.0
Lighting	0.0		0.0	0.0
Space Cooling	0.1		0.2	0.3
Street Lighting	0.0		0.0	0.0
GHG Emissions by Activity Type[1] (Mt)[b,c]				
Wholesale Trade	1.3		1.4	1.3
Retail Trade	3.2		3.4	3.1
Transportation and Warehousing	1.0		1.0	0.9
Information and Cultural Industries	0.7		0.9	0.8
Offices[2]	10.1		12.1	11.0
Educational Services	3.1		3.7	3.3
Health Care and Social Assistance	3.8		4.3	4.0
Arts, Entertainment and Recreation	0.7		0.9	0.8
Accommodation and Food Services	1.2		1.5	1.3
Other Services	0.7		0.8	0.7
GHG Intensity (tonne/TJ)[a,d]	29.9		30.1	29.0

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Excludes street lighting.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; and public administration.

Sources:
a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
c) Statistics Canada, *Electric Power Generation, Transmission and Distribution, 2002*, Ottawa, May 2004 (Cat. No. 57-202-XIB). Data for 2003 estimated by Natural Resources Canada.
d) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
28.9	33.3	33.2	35.4	39.1	50.9%
24.7	28.7	28.2	30.1	32.7	43.6%
3.2	3.5	3.6	3.6	4.0	57.1%
0.6	0.7	1.0	1.0	1.7	248.2%
0.0	0.0	0.0	0.0	0.0	–
0.0	0.0	0.0	0.0	0.0	–
0.4	0.3	0.5	0.7	0.7	758.1%
0.0	0.0	0.0	0.0	0.0	–
1.3	1.5	1.5	1.5	1.6	24.3%
3.2	3.6	3.6	4.0	4.4	38.3%
0.9	1.1	1.1	1.1	1.3	27.2%
0.9	1.0	1.0	1.1	1.2	58.6%
11.9	13.9	14.1	14.9	16.2	60.8%
3.4	4.0	3.9	4.2	5.0	59.3%
4.2	4.7	4.5	4.9	5.2	35.0%
0.9	1.0	1.0	1.1	1.2	72.2%
1.4	1.6	1.7	1.8	2.0	71.9%
0.7	0.8	0.8	0.9	1.0	35.1%
29.5	31.0	31.3	31.3	33.1	10.8%

Commercial/Institutional Secondary Energy Use by Activity Type and Energy Source

	1990	1991–1996	1997	1998
Total Energy Use for Wholesale Trade (PJ) [a]	53.3		55.9	53.3
Energy Use by Energy Source (PJ) [a]				
Electricity	28.7		29.7	29.2
Natural Gas	21.0		21.9	20.5
Light Fuel Oil and Kerosene	2.4		1.7	1.4
Heavy Fuel Oil	0.5		0.4	0.7
Steam	0.0		0.0	0.0
Other [1]	0.8		2.1	1.5
Activity				
Floor Space (million m²) [a]	27.87		28.34	28.44
Energy Intensity (GJ/m²) [a,b]	1.91		1.97	1.87
Total Energy Use for Retail Trade (PJ) [a]	129.2		137.0	131.6
Energy Use by Energy Source (PJ) [a]				
Electricity	69.6		72.4	72.6
Natural Gas	50.7		54.0	50.1
Light Fuel Oil and Kerosene	5.9		4.2	3.4
Heavy Fuel Oil	1.1		1.0	1.6
Steam	0.0		0.0	0.0
Other [1]	1.9		5.3	3.8
Activity				
Floor Space (million m²) [a]	66.26		67.78	68.58
Energy Intensity (GJ/m²) [a,b]	1.95		2.02	1.92
Total Energy Use for Transportation and Warehousing (PJ) [a]	32.7		34.2	31.0
Energy Use by Energy Source (PJ) [a]				
Electricity	14.4		14.8	13.8
Natural Gas	15.0		16.1	14.3
Light Fuel Oil and Kerosene	2.3		2.0	1.6
Heavy Fuel Oil	0.4		0.3	0.6
Steam	0.0		0.0	0.0
Other [1]	0.5		1.0	0.7
Activity				
Floor Space (million m²) [a]	21.48		21.48	21.28
Energy Intensity (GJ/m²) [a,b]	1.52		1.59	1.46

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.

Sources:

a) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.

b) Informetrica Limited, Estimates of Commercial Floor Space, 2003 Database Update, Ottawa, October 2004. Data for 2003 adjusted by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
53.3	56.9	56.7	59.3	58.8	10.2%
28.5	29.5	29.2	30.2	28.7	0.0%
21.0	23.2	22.7	24.3	23.7	12.9%
1.3	1.6	1.8	2.2	2.3	-2.1%
0.7	0.8	1.0	1.2	2.9	545.8%
0.0	0.0	0.0	0.0	0.0	-36.9%
1.8	1.8	2.0	1.4	1.1	41.3%
28.55	28.71	28.71	28.64	28.89	3.7%
1.87	1.98	1.98	2.07	2.04	6.3%
133.7	141.4	141.2	152.4	157.4	21.8%
72.3	73.2	73.5	77.2	76.2	9.5%
52.0	57.8	55.8	63.1	64.3	26.9%
3.3	4.1	4.6	5.6	6.3	5.9%
1.6	1.8	2.4	2.9	7.7	577.0%
0.0	0.0	0.0	0.0	0.0	-29.2%
4.5	4.5	4.8	3.5	3.0	57.7%
69.50	69.94	70.45	70.83	74.29	12.1%
1.92	2.02	2.00	2.15	2.12	8.6%
31.1	34.6	33.3	34.0	36.9	12.9%
13.4	14.2	13.6	13.5	14.2	-1.5%
14.8	16.8	15.7	16.1	16.8	11.6%
1.5	2.0	2.2	2.3	2.6	12.1%
0.6	0.7	0.9	1.0	2.6	509.5%
0.0	0.0	0.0	0.0	0.0	6.2%
0.8	1.0	1.0	1.0	0.8	50.4%
21.05	21.10	20.87	20.58	21.81	1.5%
1.48	1.64	1.60	1.65	1.69	11.2%

continued ——

Commercial/Institutional Secondary Energy Use by Activity Type and Energy Source *(continued)*

	1990	1991–1996	1997	1998
Total Energy Use for Information and Cultural Industries (PJ) [a]	**24.1**		**29.8**	**28.2**
Energy Use by Energy Source (PJ) [a]				
Electricity	10.5		12.9	12.6
Natural Gas	11.1		13.5	12.6
Light Fuel Oil and Kerosene	1.9		2.1	1.8
Heavy Fuel Oil	0.2		0.3	0.4
Steam	0.0		0.0	0.0
Other [1]	0.3		0.9	0.7
Activity				
Floor Space (million m²) [b]	10.31		12.53	12.84
Energy Intensity (GJ/m²) [a,b]	**2.34**		**2.38**	**2.20**
Total Energy Use for Offices [2] **(PJ)** [a]	**336.7**		**402.2**	**379.6**
Energy Use by Energy Source (PJ) [a]				
Electricity	149.3		174.1	171.4
Natural Gas	155.8		188.5	173.7
Light Fuel Oil and Kerosene	21.2		20.0	16.4
Heavy Fuel Oil	4.1		4.0	5.7
Steam	0.1		0.3	0.2
Other [1]	6.3		15.3	12.2
Activity				
Floor Space (million m²) [b]	166.46		192.56	196.36
Energy Intensity (GJ/m²) [a,b]	**2.02**		**2.09**	**1.93**
Total Energy Use for Educational Services (PJ) [a]	**78.2**		**94.0**	**86.5**
Energy Use by Energy Source (PJ) [a]				
Electricity	22.1		26.5	25.5
Natural Gas	42.2		50.7	46.5
Light Fuel Oil and Kerosene	10.0		9.6	8.0
Heavy Fuel Oil	2.0		2.0	2.7
Steam	0.0		0.1	0.0
Other [1]	1.8		5.1	3.7
Activity				
Floor Space (million m²) [b]	65.92		76.26	77.33
Energy Intensity (GJ/m²) [a,b]	**1.19**		**1.23**	**1.12**

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Other" includes coal and propane.
2) "Offices" includes activities related to finance and insurance; real estate and rental and leasing; professional, scientific and technical services; and public administration.

Sources:

a) Natural Resources Canada, Commercial/Institutional End-Use Model, Ottawa, February 2005.
b) Informetrica Limited, Estimates of Commercial Floor Space, 2003 Database Update, Ottawa, October 2004. Data for 2003 adjusted by Natural Resources Canada.

continued

1999	2000	2001	2002	2003	Total Growth 1990–2003
28.9	**32.8**	**32.1**	**34.1**	**35.0**	**45.0%**
12.7	13.6	13.4	13.6	13.8	32.0%
13.1	15.3	14.5	15.4	15.4	38.5%
1.8	2.3	2.5	3.3	3.6	86.7%
0.4	0.5	0.6	0.6	1.2	392.1%
0.0	0.0	0.0	0.0	0.0	-25.1%
0.9	1.0	1.0	1.2	0.9	172.7%
13.17	13.51	13.75	14.03	14.41	39.7%
2.20	**2.43**	**2.33**	**2.43**	**2.43**	**3.8%**
402.2	**448.6**	**445.9**	**477.1**	**497.7**	**47.8%**
176.8	186.7	182.8	199.4	199.4	33.6%
188.6	217.9	214.7	226.9	231.6	48.7%
16.6	22.1	22.8	24.9	26.7	26.3%
5.6	7.0	10.8	10.7	25.5	523.5%
0.2	0.2	0.2	0.2	0.2	209.7%
14.5	14.7	14.7	15.0	14.2	124.1%
200.51	204.53	207.77	211.74	220.63	32.5%
2.01	**2.19**	**2.15**	**2.25**	**2.26**	**11.5%**
89.2	**101.2**	**96.2**	**102.4**	**117.8**	**50.7%**
26.3	27.6	26.0	27.1	30.1	35.9%
48.4	55.9	51.3	54.9	59.6	41.3%
7.6	9.6	10.3	11.5	13.2	31.4%
2.7	3.3	3.9	4.1	10.4	421.8%
0.0	0.0	0.0	0.0	0.0	-15.0%
4.2	4.7	4.6	4.7	4.6	150.8%
78.59	79.96	81.77	83.59	87.94	33.4%
1.13	**1.27**	**1.18**	**1.22**	**1.34**	**13.0%**

continued

Commercial/Institutional Secondary Energy Use by Activity Type and Energy Source *(continued)*

	1990	1991–1996	1997	1998
Total Energy Use for Health Care and Social Assistance (PJ)*	**106.2**		**121.5**	**115.1**
Energy Use by Energy Source (PJ)*				
Electricity	36.5		41.9	41.5
Natural Gas	54.2		61.6	57.6
Light Fuel Oil and Kerosene	11.6		11.1	9.2
Heavy Fuel Oil	2.6		2.5	3.5
Steam	0.0		0.1	0.0
Other[1]	1.6		4.2	3.1
Activity				
Floor Space (million m²)[2]	34.64		39.61	40.19
Energy Intensity (GJ/m²)**	**3.07**		**3.07**	**2.86**
Total Energy Use for Arts, Entertainment and Recreation (PJ)*	**23.2**		**30.8**	**28.5**
Energy Use by Energy Source (PJ)*				
Electricity	10.2		12.5	12.8
Natural Gas	10.3		13.6	12.5
Light Fuel Oil and Kerosene	2.0		3.4	2.0
Heavy Fuel Oil	0.2		0.3	0.4
Steam	0.0		0.0	0.0
Other[1]	0.3		1.0	0.9
Activity				
Floor Space (million m²)[2]	11.09		14.17	14.33
Energy Intensity (GJ/m²)**	**2.10**		**2.17**	**1.99**

1) "Other" includes coal and propane.

1991–1996 data available at oee.nrcan.gc.ca/handbook98

Sources

a) Natural Resources Canada, Commercial/Institutional Fuel-Use Model, Ottawa, February 2000.

b) Informetrica Limited, Estimates of Commercial Floor Space, 2000 Database Update, Ottawa, October 2000. Data for 2000 adjusted by Natural Resources Canada.

continued ——^

1999	2000	2001	2002	2003	Total Growth 1990–2003
119.0	**127.9**	**123.6**	**132.9**	**135.2**	**27.3%**
43.0	42.7	41.0	44.7	43.3	18.7%
60.3	66.5	62.9	66.5	63.6	13.4%
9.5	11.6	11.6	14.1	14.9	28.7%
3.8	4.0	4.4	4.1	10.8	297.8%
0.0	0.0	0.0	0.0	0.0	37.3%
3.4	3.6	3.6	3.5	3.2	73.1%
40.85	41.19	41.96	42.91	43.34	25.1%
2.91	**3.11**	**2.95**	**3.10**	**3.12**	**1.7%**
29.3	**32.6**	**32.2**	**33.7**	**34.8**	**48.9%**
12.9	13.6	13.3	13.4	13.8	31.7%
13.1	14.9	14.5	14.5	13.9	34.7%
2.0	2.6	2.7	3.8	4.1	181.9%
0.4	0.5	0.6	0.6	2.2	772.7%
0.0	0.0	0.0	0.0	0.0	64.8%
1.0	1.1	1.1	1.4	1.1	226.2%
15.52	14.79	15.03	15.19	15.44	39.2%
2.01	**2.21**	**2.14**	**2.22**	**2.26**	**7.7%**

continued ——v

Commercial/Institutional Secondary Energy Use by Activity Type and Energy Source *(continued)*

	1990	1991 - 1996	1997	1998
Total Energy Use for Accommodation and Food Services (PJ) [1]	54.9		64.1	63.0
Energy Use by Energy Source (PJ) [1]				
Electricity	23.3		36.4	37.9
Natural Gas	16.8		21.4	20.6
Light Fuel Oil and Kerosene	2.5		3.4	2.8
Heavy Fuel Oil	9.5		9.5	8.7
Steam	0.8		0.8	0.8
Other [1]	2.1		3.4	2.3
Activity				
Floor Space (million m²)	27.31		25.26	25.55
Energy Intensity (GJ/m²) [2]	2.46		2.54	2.47
Total Energy Use for Other Services (PJ) [1]	19.5		21.5	19.9
Energy Use by Energy Source (PJ) [1]				
Electricity	6.5		6.9	6.9
Natural Gas	10.1		11.4	10.5
Light Fuel Oil and Kerosene	2.2		1.9	1.6
Heavy Fuel Oil	0.3		0.3	0.5
Steam	0.0		0.0	0.0
Other [1]	0.4		0.9	0.7
Activity				
Floor Space (million m²)	12.54		13.22	12.39
Energy Intensity (GJ/m²) [2]	1.55		1.62	1.49

1991 - 1996 data available at www.nrcan.gc.ca/handbook09

1) "Other" includes coal and propane.

Sources:

a) Natural Resources Canada, Commercial/Institutional End Use Model, Ottawa, February 2005

b) InfoMetrica Limited, Estimates of Commercial Floor Space, 2003 Database Update, Ottawa, October 2004
Data for 2003 adjusted by Natural Resources Canada.

continued ——►

1999	2000	2001	2002	2003	Total Growth 1990–2003
64.5	66.5	69.6	74.1	74.3	**35.3%**
37.6	37.4	37.8	43.2	38.6	15.8%
21.6	23.0	28.5	23.1	23.8	43.8%
1.9	2.5	2.9	2.9	4.1	65.2%
0.7	0.8	1.6	1.6	4.8	957.3%
0.8	0.8	0.9	0.9	0.9	185.4%
2.5	2.8	2.9	3.5	2.1	47.8%
25.82	26.04	26.27	26.99	27.24	22.1%
2.50	**2.55**	**2.65**	**2.74**	**2.73**	**10.8%**
20.5	**22.4**	**22.4**	**22.9**	**24.0**	**23.2%**
6.8	6.8	6.9	9.6	6.7	3.9%
10.8	12.2	11.6	12.4	12.2	20.9%
1.9	1.9	2.9	2.2	2.4	10.1%
0.5	0.6	0.1	0.6	1.6	490.2%
0.8	0.8	0.9	0.8	0.8	6.5%
0.8	0.9	0.9	0.9	0.7	54.8%
13.39	13.40	13.58	13.73	13.85	10.4%
1.53	**1.66**	**1.65**	**1.67**	**1.73**	**11.6%**

Commercial/Institutional Energy Prices and Background Indicators

	1990	1991–1996	1997	1998
Energy Prices by Energy Source (incl. taxes)				
Natural Gas (cents/m³)[a]	15.3		18.8	20.0
Light Fuel Oil (cents/litre)[a]	25.8		25.3	19.4
Heavy Fuel Oil (cents/litre)[a]	14.1		17.7	12.9
Electricity (40 kW/10,000 kWh)[1] (cents/kWh)[a,b]	7.6		9.4	9.1
Electricity (500 kW/100,000 kWh)[1] (cents/kWh)[a,b]	8.4		10.6	10.3
Background Indicators				
Commercial/Institutional Floor Space (million m²)[c]	438.9		491.3	498.3
Commercial/Institutional Employees (thousands)[d]	9,319		10,109	10,449
Employees (per thousand m²)[c,d]	23.1		20.4	21.0
Commercial/Institutional GDP (million $97)[e]	471,513		550,439	572,928

1991–1996 data available at oee.nrcan.gc.ca/handbook05

1) kW refers to power hook-up, whereas kWh refers to monthly electricity consumption.

Sources:

a) Statistics Canada, *Energy Statistics Handbook*, Ottawa, August 2004 (Cat. No. 57-601-XIE)
b) Calculated based on Hydro Québec's *Comparison of Electricity Prices in Major North American Cities*, May 2003.
c) Informetrica Limited, Estimates of Commercial Floor Space, 2003 Database Update, Ottawa, October 2004. Data for 2003 adjusted by Natural Resources Canada.
d) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.
e) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM)

1999	2000	2001	2002	2003	Total Growth 1990–2003
21.4	26.3	37.0	31.7	39.4	157.4%
24.0	40.1	35.6	34.7	38.6	50.1%
17.9	28.5	26.9	29.6	31.1	121.4%
9.1	8.6	8.7	9.1	9.3	21.7%
10.3	9.5	10.0	10.3	11.3	34.2%
506.0	513.3	529.2	528.2	547.8	24.8%
10,745	11,042	11,214	11,470	11,759	26.2%
21.2	21.5	21.6	21.7	21.5	-7.1%
604,503	633,917	655,283	681,768	697,017	47.8%

Chapter 4
Industrial Sector

The Data Situation

The aggregate energy use data presented for the industrial sector are taken from Statistics Canada's *Report on Energy Supply-Demand in Canada* (RESD) (Cat. No. 57-003-XIB).

RESD data are estimated from a suite of Statistics Canada surveys of energy distributors and end-users. Until 1993, most of the data were estimated from supply sources. This changed with the expansion of the *Industrial Consumption of Energy* (ICE) survey. The ICE survey sample was increased from 230 respondents in 1993 to approximately 2,000 respondents in 1995. Therefore, as of 1995, data were available for 22 industries at the two-digit Standard Industrial Classification level and for 31 sub-industries at the three- and four-digit level. For the 2001 reporting year, the conversion to the North American Industry Classification System (NAICS), which added nine industries, combined with an increased sample size to approximatively 2,500 respondents, resulted in the inclusion of 36 new industries into ICE.

To examine industrial end-use energy trends over time, the Office of Energy Efficiency (OEE) asked Statistics Canada to conduct a backcast of approximately 60 NAICS manufacturing industries. In this report we present 40 of these industries, along with 10 non-manufacturing industries (for which we have a complete data set). The backcast was completed for 1990 and for the 1995 to 2000 period. The 1990 data were estimated from a variety of sources including the RESD, ICE and the *Annual Survey of Manufactures*. However, due to the smaller sample size in years prior to 2001, it is not possible to backcast for all 27 of the new industries that were included in the 2001 expansion of ICE. Although they are not presented here, these industries are part of the OEE's database.

Each year, the Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC) updates its energy end-use database using energy consumption data from the ICE survey. Energy use data from CIEEDAC's database were calibrated to match the RESD energy use data in the OEE's database to produce the data reported here.

For the 1990 to 2003 period, Informetrica Limited has provided physical units, gross domestic product (GDP), and gross output data. Because of the methodology used to calculate GDP, the GDP of industries are not additive (i.e. do not sum to the reported total) in years prior to the 1997 base year.

Industrial oil and natural gas prices are taken from Statistics Canada's *Energy Statistics Handbook* (Cat. No. 57-601-XIE). Electricity prices are a weighted average of the data found in Hydro-Québec's *Comparison of Electricity Prices in Major North American Cities*.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Industrial Secondary Energy Use and GHG Emissions by Energy Source

	1990	1991–1996	1997	1998
Total Energy Use (PJ)[a,d]	2,717.4		2,997.8	2,939.8
Energy Use by Energy Source (PJ)[a,d]				
Electricity	658.4		757.6	768.7
Natural Gas	837.2		953.1	897.3
Diesel Fuel Oil, Light Fuel Oil and Kerosene	126.7		148.2	134.2
Heavy Fuel Oil	201.1		154.4	149.4
Still Gas and Petroleum Coke	321.7		350.5	335.6
LPG and Gas Plant NGL	27.0		31.4	31.6
Coal	45.1		44.4	44.2
Coke and Coke Oven Gas	131.3		132.4	131.6
Wood Waste and Pulping Liquor	341.0		399.8	416.3
Other[1]	27.9		26.0	31.0
Activity				
GDP (million $97)[b]	199,811		225,711	234,841
GO (million $97)[b]	517,528		624,030	645,170
Energy Intensity (MJ/$97 – GDP)[a,b,d]	13.6		13.3	12.5
Energy Intensity (MJ/$97 – GO)[a,b,d]	5.3		4.8	4.6
Total GHG Emissions Including Electricity (Mt)[a,c,d]	141.7		152.3	153.6
GHG Emissions by Energy Source (Mt)[a,c,d]				
Electricity	37.0		41.8	47.8
Natural Gas	42.1		47.6	44.7
Diesel Fuel Oil, Light Fuel Oil and Kerosene	10.0		11.7	10.7
Heavy Fuel Oil	15.0		11.5	10.9
Still Gas and Petroleum Coke	20.9		22.7	22.6
LPG and Gas Plant NGL	1.6		1.9	1.9
Coal	3.7		3.7	3.7
Coke and Coke Oven Gas	11.3		11.4	11.3
Wood Waste and Pulping Liquor	0.0		0.0	0.0
Other[1]	0.0		0.0	0.0
GHG Intensity (tonne/TJ)[a,c,d]	52.2		50.8	52.2
Total GHG Emissions Excluding Electricity (Mt)[a,c,d]	104.7		110.5	105.8
GHG Intensity (tonne/TJ)[a,c,d]	38.5		36.9	36.0

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Other" includes steam and waste fuels.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.
c) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).
d) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
3,028.1	**3,120.3**	**2,998.1**	**3,160.9**	**3,245.7**	**19.4%**
783.8	810.8	809.2	822.6	831.5	26.3%
907.3	950.2	847.2	929.3	968.9	15.7%
136.5	145.4	140.7	134.1	142.8	12.7%
140.8	144.3	144.2	125.7	154.0	-23.4%
349.4	341.4	378.8	443.1	437.2	35.9%
30.2	39.4	41.2	36.3	32.0	18.3%
45.6	51.1	48.8	47.6	49.9	10.6%
135.1	136.5	128.6	125.1	125.8	-4.2%
464.0	464.4	421.1	458.6	464.7	36.3%
35.3	36.8	38.4	38.6	39.0	39.9%
249,318	271,254	266,003	270,430	275,426	37.8%
700,286	785,780	776,782	806,265	806,163	55.8%
12.1	**11.5**	**11.3**	**11.7**	**11.8**	**-13.3%**
4.3	**4.0**	**3.9**	**3.9**	**4.0**	**-23.3%**
153.4	**161.3**	**159.2**	**162.1**	**168.9**	**19.2%**
46.7	50.6	52.4	50.3	53.0	43.3%
45.3	47.6	42.3	46.4	48.2	14.5%
10.9	11.6	11.2	10.7	11.4	13.7%
10.3	10.6	10.6	9.2	11.3	-24.8%
23.0	22.6	25.1	28.7	28.3	35.4%
1.8	2.4	2.5	2.2	1.9	19.3%
3.8	4.2	4.0	3.9	3.9	5.9%
11.6	11.7	11.0	10.7	10.8	-4.7%
0.0	0.0	0.0	0.0	0.0	–
0.0	0.0	0.0	0.0	0.0	–
50.7	**51.7**	**53.1**	**51.3**	**52.0**	**-0.2%**
106.7	**110.7**	**106.7**	**111.8**	**115.9**	**10.6%**
35.2	**35.5**	**35.6**	**35.4**	**35.7**	**-7.4%**

Industrial Secondary Energy Use by Industry

	1990	1991–1996	1997	1998
Total Energy Use (PJ)[a,c]	2,717.4		2,997.8	2,939.8
Energy Use by Industry (PJ)[a,c]				
Gold and Silver Mines	13.0		14.6	12.3
Copper, Nickel, Lead and Zinc Mines	35.1		26.9	26.1
Iron Mines	36.2		39.5	36.0
Other Metal Mines	9.0		4.9	4.3
Potash Mines	27.4		32.6	31.6
Salt Mines	2.9		2.9	2.7
Other Non-Metal Mines	9.1		8.3	7.2
Upstream Mining	210.6		344.4	337.7
Construction	66.9		49.5	48.0
Forestry	7.7		11.1	12.3
Pulp Mills	309.1		358.4	358.2
Paper Mills (except newsprint)	99.4		103.3	109.5
Newsprint Mills	268.3		282.4	273.5
Paperboard Mills	61.1		67.7	70.4
Converted Paper Products Industry	9.6		11.5	11.6
Primary Production of Alumina and Aluminum	109.8		156.8	159.8
Other Non-Ferrous Smelting and Refining	73.4		74.2	79.3
Petroleum Refining	334.9		320.9	291.9
Cement Industry	59.3		57.8	60.4
Petrochemical Industry	32.3		41.8	40.5
Industrial Gas Industry	5.9		5.8	6.3
Other Basic Chemicals Industry	149.2		139.3	134.2
Fertilizer Industry	35.7		59.1	60.2
Iron and Steel	219.4		251.2	254.7
Meat Products Industries	12.6		15.5	15.7
Fruit and Vegetable Industries	9.2		12.6	13.2
Bakery Products Industries	9.2		6.3	7.1
Other Food Industries	40.9		47.7	39.9
Dairy Products Industry	11.8		11.9	12.1
Beverage Industries (excluding breweries)	3.3		5.9	6.6

1991–1994 data not available, 1995–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
b) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.
c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
3,028.1	3,120.3	2,998.1	3,160.9	3,245.7	19.4%
13.2	12.5	13.6	14.3	13.8	6.6%
21.2	22.9	24.3	21.8	20.6	-41.3%
30.1	33.7	28.3	28.2	34.0	-6.1%
4.2	4.9	8.2	10.3	7.5	-16.5%
32.5	29.7	28.5	28.3	29.8	8.9%
2.6	2.6	2.5	2.4	2.6	-11.8%
8.3	9.2	8.8	8.6	8.2	-9.8%
347.5	401.3	408.1	448.3	512.3	143.2%
50.4	49.9	47.9	54.2	56.7	-15.2%
14.8	16.2	18.3	17.1	18.7	142.4%
387.1	391.4	358.3	377.4	376.1	21.7%
116.7	121.3	109.3	109.8	124.9	25.7%
305.0	300.5	262.5	276.4	266.3	-0.8%
72.1	68.8	66.7	67.3	66.5	8.9%
10.9	12.3	15.4	16.6	16.2	68.5%
166.0	159.9	164.1	169.4	173.2	57.7%
70.5	74.9	84.8	85.7	90.0	22.6%
288.0	295.1	311.4	365.2	375.0	12.0%
63.5	63.6	61.9	64.8	62.0	4.5%
38.9	42.5	45.1	46.0	52.7	63.1%
7.3	8.5	8.9	9.1	9.2	55.6%
131.7	115.5	91.5	91.3	71.3	-52.2%
62.4	63.5	62.2	54.1	57.9	61.9%
259.8	257.6	228.5	239.5	233.7	6.5%
16.3	19.2	19.5	18.2	17.9	42.1%
11.2	13.1	13.6	13.2	13.8	50.7%
6.8	7.2	8.9	9.8	9.4	2.2%
42.9	44.4	37.4	37.8	38.8	-5.1%
12.9	12.6	12.3	12.3	12.1	2.3%
6.8	6.3	5.4	6.1	6.0	78.3%

continued ——

Industrial Secondary Energy Use by Industry *(continued)*

	1990	1991–1996	1997	1998
Energy Use by Industry (PJ) [a] *(continued)*				
Beverage Industries	7.8		5.5	5.6
Tobacco Products Industries	1.2		1.1	1.1
Rubber Products Industries	9.1		10.5	10.9
Plastic Products Industries	13.8		20.8	21.3
Resin and Synthetic Rubber Industries	25.4		22.7	24.0
Leather and Allied Products Industries	1.4		1.0	1.2
Textile Mills	13.9		14.4	13.5
Textile Products Mills	4.4		4.4	4.1
Clothing Industries	3.0		3.1	3.3
Wood Products Industries	61.0		66.1	69.4
Furniture and Related Products Industries	4.3		1.4	1.6
Printing and Related Support Activities	10.5		8.8	8.9
Petroleum and Coal Products Industries	22.4		26.6	27.2
Machinery Industries	13.3		14.5	15.4
Motor Vehicle Industry	15.7		27.5	27.9
Motor Vehicle Parts and Accessories Industries	14.5		19.0	19.5
Computer and Electronic Products Industries	4.6		6.5	7.2
Electrical Equipment and Components Industries	4.6		6.1	6.4
Other Industry	10.5		14.4	14.4
Other Manufacturing [b,c]	194.0		128.6	101.5
Activity				
GDP (million $97) [c]	100,611		125,711	126,844
GO (million $97) [c]	171,536		224,535	225,135
Energy Intensity (MJ/$97 – GDP) [c]	**13.8**		**13.3**	**12.5**
Energy Intensity (MJ/$97 – GO) [c]	**5.2**		**4.8**	**4.6**

1991–1996 data not available. 1995–1996 data available at www.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, Report on Energy Supply-Demand in Canada, 1998–2002 (Ottawa: September 2004 (CANSIM).

b) Information is contact. G Moran and Natural Resources Canada (Ottawa: January 2005).

c) Canadian Industry Energy End-Use Data and Analysis Centre, Development of Energy Intensity Indicators for Canadian Industry, 1990 to 2002 (Simon Fraser University, January 2005).

continued →

1999	2000	2001	2002	2003	Total Growth 1990–2003
5.2	5.9	5.8	6.1	5.2	-33.3%
1.0	1.1	1.0	1.0	1.0	-23.6%
12.3	13.0	11.5	11.9	12.9	24.2%
19.0	22.8	26.1	23.1	25.1	58.7%
28.6	29.4	32.4	28.5	24.7	-15.1%
1.2	1.2	0.9	1.1	0.9	-29.1%
11.5	10.5	9.1	8.7	8.3	-40.6%
4.6	4.2	4.2	4.5	4.2	-37.9%
4.6	5.5	5.5	5.4	5.3	-11.1%
69.5	70.8	74.2	70.1	70.1	-12.1%
6.2	10.2	11.5	10.6	11.2	-79.8%
8.2	10.5	9.5	9.1	9.1	-16.7%
36.2	35.3	41.1	43.2	44.2	-18.1%
12.5	14.6	13.1	14.8	13.9	-13.4%
25.9	29.2	25.2	29.6	29.6	-32.9%
20.6	22.6	22.0	25.5	25.6	-39.5%
6.6	7.5	3.8	4.2	4.6	-1.0%
7.6	7.6	6.8	6.4	6.2	-27.0%
16.7	16.9	14.5	15.8	14.6	-9.8%
113.5	132.6	121.6	134.8	158.5	-0.5%
346,216	371,254	366,502	370,438	375,436	-27.8%
790,284	795,790	776,783	806,385	866,743	-16.8%
12.1	**11.5**	**11.3**	**11.7**	**11.6**	**-13.3%**
4.2	**4.8**	**3.9**	**3.9**	**4.8**	**-23.3%**

Industrial GHG Emissions by Industry – Including Electricity-Related Emissions[1]

	1990	1991–1996	1997	1998
Total GHG Emissions Including Electricity (Mt)[a,c]	141.7		152.3	153.6
GHG Emissions by Industry (Mt)[a,c]				
Gold and Silver Mines	0.8		0.9	0.8
Copper, Nickel, Lead and Zinc Mines	2.2		1.6	1.7
Iron Mines	2.5		2.8	2.6
Other Metal Mines	8.5		8.3	9.3
Potash Mines	1.5		1.7	1.7
Salt Mines	0.2		0.2	0.2
Other Non-Metal Mines	0.6		0.5	0.5
Upstream Mining	13.1		20.9	21.2
Construction	4.6		3.4	3.4
Forestry	0.6		0.9	1.0
Pulp Mills	6.6		6.4	6.2
Paper Mills (except newsprint)	3.4		3.2	3.4
Newsprint Mills	11.5		11.3	11.4
Paperboard Mills	2.1		2.2	2.3
Consumer Paper Products Industry	0.5		0.6	0.6
Primary Production of Aluminum and Aluminum	6.2		8.7	9.8
Other Non-Ferrous Smelting and Refining	4.5		4.5	5.2
Petroleum Refining	20.8		20.2	19.6
Cement Industry	4.1		4.0	4.2
Petrochemical Industry	1.7		2.1	2.1
Industrial Gas Industry	0.3		0.3	0.4
Other Basic Chemicals Industry	1.0		1.1	1.2
Fertilizer Industry	1.8		3.0	2.1
Iron and Steel	15.9		17.3	17.8
Metal Products Industries	0.7		0.8	0.9
Fruit and Vegetable Industries	0.5		0.7	0.8
Bakery Products Industries	0.3		0.3	0.4
Other Food Industries	2.1		2.4	2.1
Dairy Products Industry	0.9		0.6	0.7
Beverage Industries (excluding breweries)	0.3		0.3	0.4

1) Includes only emissions from non-energy-related GHG emissions.

Sources

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1998-2002*. Ottawa: September 2004 (CANSIM).

b) GHG emissions section from Environment Canada, *Canadian Greenhouse Gas Inventory 1990-2002*. Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002).

c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Decomposition of Energy Intensity Indicators for Canadian Industry 1990 to 2002*. Simon Fraser University, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990-2003
153.4	161.3	150.2	162.1	168.9	19.2%
0.8	0.8	0.9	0.9	0.9	14.5%
1.2	1.9	1.6	1.4	1.4	-36.7%
2.1	2.4	2.1	2.6	2.5	-2.8%
0.2	0.2	0.5	0.9	0.5	6.4%
1.7	1.6	1.5	1.5	1.9	9.0%
0.7	0.1	0.7	0.1	0.7	7.6%
0.5	0.6	0.6	0.6	0.6	-2.7%
21.8	24.9	25.1	26.4	30.0	128.2%
2.5	2.5	3.4	3.8	2.9	-14.2%
1.2	1.2	1.5	1.4	1.5	142.5%
6.4	7.1	6.8	6.8	6.8	9.4%
2.5	2.9	2.8	3.1	2.8	13.5%
11.4	11.4	11.8	10.4	10.2	-11.6%
2.4	2.2	2.1	2.6	2.1	8.7%
0.6	0.6	0.8	0.8	0.8	47.4%
9.8	9.9	10.5	10.2	11.0	76.5%
4.4	4.8	5.5	5.2	5.8	39.2%
18.2	18.8	20.2	23.2	23.7	13.8%
4.5	4.5	4.4	4.7	4.4	11.6%
2.0	2.1	2.2	2.2	2.3	36.8%
0.4	0.5	0.6	0.5	0.6	76.3%
7.0	6.2	5.1	4.8	4.2	-39.1%
3.2	3.3	3.2	2.8	2.9	61.8%
19.1	19.1	19.5	19.8	19.5	4.3%
0.9	1.1	1.1	1.0	1.0	47.0%
0.6	0.8	0.9	0.8	0.8	59.2%
0.4	0.4	0.5	0.5	0.5	7.4%
2.2	2.5	2.6	2.9	2.8	6.0%
0.7	0.7	0.7	0.7	0.7	3.1%
0.4	0.5	0.3	0.3	0.3	75.8%

continued ——→

Industrial GHG Emissions by Industry – Including Electricity-Related Emissions[1] *(continued)*

	1990	1991–1996	1997	1998
GHG Emissions by Industry (Mt) [a,b,c] **(continued)**				
Breweries Industries	0.4		0.3	0.3
Tobacco Products Industries	0.1		0.1	0.1
Rubber Products Industries	0.5		0.5	0.6
Plastic Products Industries	0.9		1.1	1.2
Resin and Synthetic Rubber Industries	1.3		1.5	1.7
Leather and Allied Products Industries	0.1		0.1	0.1
Textile Mills	0.7		0.8	0.7
Textile Products Mills	0.4		0.4	0.3
Clothing Industries	0.3		0.3	0.3
Wood Products Industries	3.5		3.7	4.0
Furniture and Related Products Industries	0.3		0.4	0.4
Printing and Related Support Activities	0.6		0.4	0.4
Fabricated Metal Products Industries	2.0		2.1	2.0
Machinery Industries	0.7		0.8	0.9
Motor Vehicle Industry	1.0		1.4	1.4
Motor Vehicle Parts and Accessories Industries	1.0		1.0	1.1
Computer and Electronic Products Industries	0.3		0.3	0.4
Electrical Equipment and Components Industries	0.5		0.5	0.4
Lime Industry	1.0		1.1	1.1
Other Manufacturing n.e.c.	5.5		6.3	5.1
GHG Intensity (tonne/TJ) [a,b,c]	52.2		50.8	52.2

1991–1994 data not available, 1995–1996 data available at oee.nrcan.gc.ca/handbook05

1) Includes only end-use energy related GHG emissions.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).

b) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

continued

1999	2000	2001	2002	2003	Total Growth 1990–2003
0.3	0.3	0.3	0.3	0.3	-28.1%
0.1	0.1	0.1	0.1	0.1	-16.9%
0.7	0.7	0.7	0.7	0.7	28.9%
1.1	1.3	1.6	1.3	1.5	68.9%
1.7	2.0	1.6	1.3	1.0	-22.3%
0.1	0.1	0.1	0.1	0.0	-33.1%
0.6	0.6	0.5	0.5	0.5	-37.1%
0.3	0.2	0.2	0.2	0.2	-33.8%
0.3	0.3	0.3	0.3	0.3	5.6%
4.0	4.2	4.4	4.5	4.1	19.2%
0.4	0.6	0.7	0.6	0.6	90.4%
0.4	0.6	0.5	0.5	0.5	-11.2%
1.9	1.9	2.1	2.3	2.4	23.5%
0.7	0.8	0.8	0.8	0.8	20.6%
1.5	1.6	1.2	1.3	1.3	32.4%
1.1	1.3	1.3	1.4	1.4	35.5%
0.4	0.4	0.3	0.3	0.3	5.7%
0.4	0.4	0.4	0.2	0.3	-23.5%
1.1	1.1	1.1	1.1	1.0	0.7%
5.8	6.9	6.4	7.2	8.5	-0.2%
50.7	51.7	53.1	51.3	52.0	-0.2%

Industrial GHG Emissions by Industry – Excluding Electricity-Related Emissions[1]

	1990	1991–1996	1997	1998
Total GHG Emissions Excluding Electricity (Mt)[a,b,c]	104.7		110.5	105.8
GHG Emissions by Industry (Mt)[a,b,c]				
Gold and Silver Mines	0.4		0.5	0.3
Copper, Nickel, Lead and Zinc Mines	0.9		0.8	0.7
Iron Mines	1.8		1.9	1.7
Other Metal Mines	0.3		0.2	0.2
Potash Mines	1.1		1.4	1.2
Salt Mines	0.1		0.1	0.1
Other Non-Metal Mines	0.5		0.4	0.4
Upstream Mining	10.5		17.1	16.6
Construction	4.6		3.4	2.4
Forestry	0.6		0.9	1.0
Pulp Mills	4.2		3.8	3.4
Paper Mills (except newsprint)	2.2		2.1	2.1
Newsprint Mills	5.9		4.6	3.8
Paperboard Mills	1.6		1.6	1.6
Converted Paper Products Industry	0.4		0.4	0.4
Primary Production of Alumina and Aluminum	0.7		0.8	1.0
Other Non-Ferrous Smelting and Refining	2.6		2.5	2.6
Petroleum Refining	19.7		19.2	17.9
Cement Industry	3.8		3.6	3.7
Petrochemical Industry	1.5		1.9	1.8
Industrial Gas Industry	0.0		0.0	0.0
Other Basic Chemicals Industry	4.0		4.2	4.1
Fertilizer Industry	1.6		2.7	2.7
Iron and Steel	14.2		15.5	15.5
Meat Products Industries	0.5		0.5	0.5
Fruit and Vegetable Industries	0.4		0.6	0.6
Bakery Products Industries	0.4		0.2	0.3
Other Food Industries	1.2		1.7	1.5
Dairy Products Industry	0.5		0.5	0.5
Beverage Industries (excluding breweries)	0.1		0.3	0.3

1991, 1994 data not available; 1995, 1996 data available at: oee.nrcan.gc.ca/handbook05

1) Includes only end-use energy-related GHG emissions.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).

b) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990-2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
106.7	110.7	106.7	111.8	115.9	10.6%
0.3	0.4	0.4	0.4	0.4	2.4%
0.6	0.7	0.7	0.7	0.6	-34.8%
1.4	1.6	1.4	1.4	1.7	-7.9%
0.2	0.2	0.3	0.3	0.3	-17.6%
1.4	1.2	1.2	1.1	1.2	7.5%
0.1	0.1	0.1	0.1	0.1	-20.3%
0.4	0.5	0.5	0.5	0.5	7.7%
17.4	20.1	19.8	21.5	24.9	137.6%
3.5	3.5	3.4	3.8	3.9	-14.3%
1.2	1.3	1.5	1.4	1.5	143.5%
3.4	3.6	2.6	3.1	2.8	-33.8%
2.2	2.1	2.0	1.6	1.9	-16.8%
3.9	3.7	3.4	2.9	2.7	-53.8%
1.7	1.6	1.4	1.2	1.5	-9.1%
0.3	0.3	0.5	0.5	0.4	6.1%
1.0	0.8	0.9	0.9	0.8	15.5%
2.4	2.4	2.5	2.4	2.4	-5.6%
17.1	17.7	18.9	22.0	22.4	13.9%
4.0	4.0	4.0	4.2	4.2	10.7%
1.7	1.8	1.9	1.9	2.0	29.6%
0.1	0.1	0.1	0.1	0.0	-19.9%
3.9	3.1	2.1	1.8	1.2	-70.2%
2.8	2.9	2.8	2.4	2.6	63.1%
15.6	15.6	13.9	14.3	14.2	0.0%
0.6	0.7	0.7	0.6	0.6	27.3%
0.5	0.6	0.6	0.6	0.6	44.0%
0.2	0.3	0.3	0.3	0.3	-20.7%
1.7	1.6	1.4	1.5	1.5	-10.0%
0.5	0.5	0.5	0.5	0.5	-3.2%
0.3	0.3	0.2	0.3	0.2	86.2%

continued ——▾

Industrial GHG Emissions by Industry – Excluding Electricity-Related Emissions[1] *(continued)*

	1990	1991–1996	1997	1998
GHG Emissions by Industry (Mt)[a,b,c] **(continued)**				
Breweries Industries	0.3		0.2	0.2
Tobacco Products Industries	0.0		0.0	0.0
Rubber Products Industries	0.3		0.4	0.4
Plastic Products Industries	0.4		0.4	0.5
Resin and Synthetic Rubber Industries	0.9		1.1	1.1
Leather and Allied Products Industries	0.0		0.0	0.0
Textile Mills	0.5		0.5	0.4
Textile Products Mills	0.2		0.2	0.2
Clothing Industries	0.2		0.1	0.1
Wood Products Industries	2.2		2.3	2.4
Furniture and Related Products Industries	0.2		0.2	0.2
Printing and Related Support Activities	0.3		0.2	0.2
Fabricated Metal Products Industries	1.4		1.5	1.3
Machinery Industries	0.4		0.4	0.5
Motor Vehicle Industry	0.7		1.0	1.0
Motor Vehicle Parts and Accessories Industries	0.6		0.5	0.6
Computer and Electronic Products Industries	0.1		0.1	0.1
Electrical Equipment and Components Industries	0.3		0.3	0.3
Lime Industry	1.0		1.1	1.0
Other Manufacturing n.e.c.	7.9		6.3	5.1
GHG Intensity (tonne/TJ)[a,b,c]	38.5		36.9	36.0

1991–1994 data not available, 1995–1996 data available at oee.nrcan.gc.ca/handbook05

1) Includes only end-use energy-related GHG emissions.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).

b) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990-2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

continued

1999	2000	2001	2002	2003	Total Growth 1990–2003
0.2	0.2	0.2	0.3	0.2	-37.6%
0.0	0.0	0.0	0.0	0.0	-28.3%
0.4	0.4	0.4	0.4	0.4	17.0%
0.4	0.5	0.5	0.4	0.5	36.6%
1.2	1.3	1.0	0.8	0.5	-43.3%
0.0	0.0	0.0	0.0	0.0	-49.0%
0.4	0.3	0.3	0.3	0.3	-45.2%
0.1	0.1	0.2	0.2	0.2	-37.2%
0.1	0.2	0.2	0.1	0.1	-22.8%
2.2	2.3	2.2	2.2	1.9	-11.5%
0.3	0.3	0.4	0.4	0.4	86.9%
0.2	0.3	0.3	0.3	0.2	-18.4%
1.3	1.2	1.4	1.5	1.6	11.3%
0.4	0.5	0.5	0.4	0.4	1.5%
1.0	1.0	0.9	0.9	0.9	24.9%
0.6	0.7	0.7	0.8	0.8	25.4%
0.1	0.1	0.1	0.1	0.1	32.4%
0.2	0.2	0.2	0.2	0.2	-40.4%
1.1	1.1	1.1	1.1	1.0	-0.2%
5.8	6.5	6.4	7.2	8.5	6.9%
35.2	35.5	35.6	35.4	35.7	-7.4%

Industrial Gross Domestic Product by Industry

	1990	1991–1996	1997	1998
Total Gross Domestic Product (million $97) *	199,811		225,711	234,841
Gross Domestic Product by Industry (million $97) **				
Gold and Silver Mines	1,237		1,301	1,455
Copper, Nickel, Lead and Zinc Mines	3,090		2,662	2,775
Iron Mines	902		647	610
Other Metal Mines	509		417	402
Potash Mines	700		1,038	955
Salt Mines	218		243	218
Other Non-Metal Mines	270		362	383
Upstream Mining	20,265	1991–1996 data available at: oee.nrcan.gc.ca/handbook05	27,265	27,663
Construction	48,156		42,995	44,348
Forestry	7,168		6,499	6,642
Pulp Mills	1,717		1,883	1,898
Paper Mills (except newsprint)	1,824		1,876	1,806
Newsprint Mills	3,546		3,839	3,524
Paperboard Mills	692		696	654
Converted Paper Products Industry	2,011		2,542	2,654
Primary Production of Alumina and Aluminum	1,590		1,797	2,102
Other Non-Ferrous Smelting and Refining	1,105		1,556	1,716
Petroleum Refining	1,173		1,319	1,395
Cement Industry	703		680	645
Petrochemical Industry	841		844	876
Industrial Gas Industry	226		228	238
Other Basic Chemicals Industry	2,374		2,536	2,456
Fertilizer Industry	816		1,216	1,233
Iron and Steel	3,804		4,237	4,484
Meat Products Industries	2,783		2,649	2,787
Fruit and Vegetable Industries	1,288		1,858	1,760
Bakery Products Industries	1,667		1,954	2,069
Other Food Industries	4,633		5,439	5,825
Dairy Products Industry	2,443		1,961	2,140
Beverage Industries (excluding breweries)	1,026		1,281	1,484

Sources:

a) Informetrica Limited, *TI Model Database and National Reference Forecast*, Ottawa, January 2005.

b) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
249,318	271,254	266,003	270,430	275,426	37.8%
1,309	1,280	1,399	1,368	1,278	3.3%
2,725	2,669	2,665	2,464	2,172	-29.7%
532	730	521	512	586	-35.0%
480	761	715	666	623	22.4%
985	1,010	894	935	997	42.4%
209	215	236	226	244	11.9%
805	669	970	1,187	1,969	629.3%
27,354	28,125	28,250	27,846	29,624	46.2%
46,415	48,833	52,182	53,797	56,193	16.7%
6,978	7,398	7,442	7,380	7,532	5.1%
2,242	2,314	2,138	2,199	2,219	29.2%
1,851	2,149	1,879	1,943	1,978	8.4%
4,010	4,267	3,759	3,792	3,808	7.4%
786	735	717	738	696	0.6%
2,636	2,531	2,822	2,991	3,072	52.8%
2,194	2,755	2,865	3,021	3,113	95.8%
1,840	1,922	2,368	2,379	2,186	97.8%
1,311	1,254	1,363	1,389	1,444	23.1%
635	679	710	725	746	6.1%
810	965	802	788	776	-7.7%
287	313	307	309	325	43.8%
2,460	2,696	2,818	2,848	2,869	20.9%
1,226	1,329	1,060	937	1,107	35.7%
4,501	4,623	3,952	4,161	4,080	7.3%
2,837	3,361	3,607	3,536	3,382	21.5%
2,032	2,074	2,189	2,243	2,166	68.2%
2,116	2,099	2,296	2,375	2,428	45.7%
5,863	5,933	6,213	6,440	6,530	40.9%
2,096	2,067	2,211	2,203	2,257	-7.6%
1,336	1,542	1,830	1,819	1,759	71.4%

continued

Industrial Gross Domestic Product by Industry *(continued)*

	1990	1991–1996	1997	1998
Gross Domestic Product by Industry (million $97) [a,b] (continued)				
Breweries Industries	2,197		2,118	1,987
Tobacco Products Industries	1,546		1,521	1,708
Rubber Products Industries	1,261		2,162	2,157
Plastic Products Industries	3,203		4,905	5,185
Resin and Synthetic Rubber Industries	1,331		2,503	2,753
Leather and Allied Products Industries	594		421	387
Textile Mills	1,482		1,414	1,609
Textile Products Mills	773		790	825
Clothing Industries	3,173		3,267	3,266
Wood Products Industries	7,759		9,199	9,616
Furniture and Related Products Industries	2,742		3,466	4,088
Printing and Related Support Activities	5,849		4,325	4,304
Fabricated Metal Products Industries	7,532		9,327	9,832
Machinery Industries	6,613		9,831	10,130
Motor Vehicle Industry	4,597		6,129	6,527
Motor Vehicle Parts and Accessories Industries	5,003		8,523	9,098
Computer and Electronic Products Industries	4,502		7,631	8,905
Electrical Equipment and Components Industries	3,655		3,330	3,636
Lime Industry [1]	101		107	99
Other Manufacturing n.e.c.	17,391		20,922	21,532

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Estimated using Informetrica GDP data for lime and gypsum manufacturing and the value added for lime manufacturing from the *Annual Survey of Manufactures*.

Sources:

a) Informetrica Limited, *TI Model Database and National Reference Forecast*, Ottawa, January 2005.
b) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.
c) Statistics Canada, *Annual Survey of Manufactures, 1990–2002*, Ottawa, June 2004 (CANSIM).

continued

1999	2000	2001	2002	2003	Total Growth 1990–2003
2,037	2,045	2,087	2,072	2,030	-7.6%
1,369	1,347	1,146	1,070	986	-36.2%
2,230	2,225	2,116	2,048	1,901	50.8%
5,743	6,882	6,924	7,929	8,101	152.9%
2,758	3,084	2,736	2,797	2,787	109.4%
373	437	382	328	280	-52.9%
1,531	1,605	1,490	1,375	1,242	-16.2%
925	1,097	1,093	1,038	958	23.9%
3,135	3,743	3,730	3,635	3,408	7.4%
10,234	11,351	10,775	11,703	12,109	56.1%
4,465	5,187	5,444	5,692	5,713	108.4%
4,384	5,002	5,566	5,469	5,551	-5.1%
10,641	13,208	12,851	12,937	12,924	71.6%
9,983	11,463	11,617	11,777	11,545	74.6%
8,727	8,505	7,345	7,747	7,728	68.1%
9,899	10,004	9,175	10,011	10,433	108.5%
12,447	16,070	9,306	7,715	7,772	72.6%
3,836	4,674	4,722	4,390	4,155	13.7%
85	83	67	77	81	-19.8%
23,655	25,944	26,251	27,403	27,563	58.5%

Industrial Energy Intensity by Industry

	Units	1990	1991–1996	1997
Aggregate Energy Intensity [a,b,c]	MJ/$97 - GDP	13.6		13.3
Energy Intensity by Industry [a,b,c]				
Gold and Silver Mines	MJ/tonne	549.3		466.5
Copper, Nickel, Lead and Zinc Mines	MJ/tonne	241.2		262.0
Iron Mines	MJ/tonne	398.1		431.7
Other Metal Mines	MJ/tonne	406.3		406.7
Potash Mines	MJ/tonne	3,918.7		3,630.9
Salt Mines	MJ/tonne	375.3		274.3
Other Non-Metal Mines	MJ/tonne	811.6		715.1
Upstream Mining	MJ/$97 - GDP	10.4		12.6
Construction	MJ/$97 - GO	0.6		0.5
Forestry	MJ/$97 - GO	0.7		0.8
Pulp Mills	MJ/tonne	43,231.4		35,454.3
Paper Mills (except newsprint)	MJ/tonne	21,380.5		16,987.8
Newsprint Mills	MJ/tonne	29,585.4		30,667.1
Paperboard Mills	MJ/tonne	21,572.4		18,352.5
Converted Paper Products Industry	MJ/$97 - GO	1.6		1.7
Primary Production of Alumina and Aluminum	MJ/tonne	69,960.4		67,292.7
Other Non-Ferrous Smelting and Refining	MJ/tonne	48,004.2		40,751.4
Petroleum Refining	MJ/m³	3,510.8		3,156.6
Cement Industry	MJ/tonne	5,645.4		4,813.1
Petrochemical Industry	MJ/tonne	4,620.9		4,818.9
Industrial Gas Industry	MJ/$97 - GO	12.7		12.5
Other Basic Chemicals Industry	MJ/$97 - GO	22.1		21.3
Fertilizer Industry	MJ/tonne	6,303.7		8,134.0
Iron and Steel	MJ/tonne	18,961.6		17,324.9
Meat Products Industries	MJ/tonne	4,649.8		4,809.0
Fruit and Vegetable Industries	MJ/$97 - GO	2.4		2.6
Bakery Products Industries	MJ/$97 - GO	2.7		1.5
Other Food Industries	MJ/$97 - GO	2.5		2.3
Dairy Products Industry	MJ/kilolitre	1,604.2		1,603.2
Beverage Industries (excluding breweries)	MJ/$97 - GO	0.9		1.4

1991–1994 data not available, 1995–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).

b) Informetrica Limited, *TI Model Database and National Reference Forecast*, Ottawa, January 2005.

c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

1998	1999	2000	2001	2002	2003	Total Growth 1990–2003
12.5	12.1	11.5	11.3	11.7	11.8	-13.3%
354.4	304.0	304.1	329.5	343.5	338.3	38.4%
231.8	264.8	234.1	257.1	249.1	249.7	3.5%
378.9	362.3	359.1	377.0	377.6	394.9	-0.8%
338.9	383.2	409.5	592.0	615.7	406.9	0.1%
3,431.1	3,910.6	3,223.5	3,479.5	3,316.0	3,264.9	-16.7%
258.3	266.8	281.8	224.5	227.3	226.3	-39.7%
637.6	545.9	622.1	577.3	710.1	694.6	-14.4%
12.2	12.7	14.3	14.4	16.1	17.3	66.4%
0.5	0.5	0.4	0.4	0.4	0.4	-27.1%
1.0	1.0	1.2	1.6	1.4	1.5	111.8%
36,772.3	36,382.2	35,195.5	37,402.4	37,773.5	36,229.5	-16.2%
17,437.0	16,931.9	16,275.6	14,904.7	14,487.4	16,311.8	-23.7%
31,877.1	33,188.8	32,588.1	31,360.5	32,672.8	31,368.3	6.0%
18,392.1	17,800.8	16,989.1	16,836.6	16,657.0	17,357.3	-19.5%
1.5	1.3	1.3	1.5	1.6	1.6	-1.5%
67,438.4	69,451.0	67,448.9	63,593.0	62,493.8	62,095.2	-11.2%
41,852.8	37,083.1	39,612.1	48,444.0	46,816.9	54,223.8	13.0%
2,866.9	2,784.9	2,785.0	2,861.3	3,273.4	3,251.3	-7.4%
4,904.1	4,946.9	4,887.0	4,895.2	4,967.1	4,706.5	-16.6%
4,450.1	4,087.5	4,295.0	4,808.6	4,552.0	5,256.5	13.8%
12.3	12.3	13.9	14.2	13.8	14.2	11.9%
20.1	20.0	16.2	11.8	11.2	9.2	-58.5%
8,432.9	8,493.5	8,563.2	9,642.9	7,798.5	8,302.3	31.7%
18,117.9	17,390.6	17,325.2	16,101.9	15,900.7	15,715.8	-17.1%
4,486.0	4,288.9	4,892.4	4,806.4	4,300.9	4,334.9	-6.8%
2.8	2.1	2.3	2.3	2.3	2.4	-1.4%
1.6	1.4	1.5	1.8	1.9	1.8	-34.2%
1.9	2.0	2.0	1.7	1.7	1.7	29.6%
1,628.1	1,720.0	1,675.0	1,645.9	1,817.0	1,721.1	7.3%
1.5	1.5	1.3	1.1	1.2	1.2	26.8%

continued ——>

Industrial Energy Intensity by Industry *(continued)*

	Units	1990	1991–1996	1997
Energy Intensity by Industry [a,b,c] **(continued)**				
Breweries Industries	MJ/hectolitre	326.3		248.9
Tobacco Products Industries	MJ/$97 - GO	0.7		0.4
Rubber Products Industries	MJ/tonne	49,497.4		46,425.5
Plastic Products Industries	MJ/$97 - GO	1.9		1.6
Resin and Synthetic Rubber Industries	MJ/tonne	15,931.4		13,824.2
Leather and Allied Products Industries	MJ/$97 - GO	1.3		1.1
Textile Mills	MJ/$97 - GO	3.9		3.7
Textile Products Mills	MJ/$97 - GO	3.4		3.0
Clothing Industries	MJ/$97 - GO	0.8		0.7
Wood Products Industries	MJ/$97 - GO	3.8		2.5
Furniture and Related Products Industries	MJ/$97 - GO	0.9		0.9
Printing and Related Support Activities	MJ/$97 - GO	1.2		0.9
Fabricated Metal Products Industries	MJ/$97 - GO	2.2		1.9
Machinery Industries	MJ/$97 - GO	0.8		0.6
Motor Vehicle Industry	MJ/$97 - GO	1.0		1.0
Motor Vehicle Parts and Accessories Industries	MJ/$97 - GDP	0.9		0.5
Computer and Electronic Products Industries	MJ/$97 - GO	0.4		0.3
Electrical Equipment and Components Industries	MJ/$97 - GO	1.0		1.0
Lime Industry	MJ/tonne	8,393.0		6,901.9
Other Manufacturing n.e.c.	MJ/$97 - GDP	2.8		1.8

1991–1994 data not available, 1995–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).

b) Informetrica Limited, *TI Model Database and National Reference Forecast*, Ottawa, January 2005.

c) Canadian Industrial Energy End-Use Data and Analysis Centre, *Development of Energy Intensity Indicators for Canadian Industry 1990 to 2003*, Simon Fraser University, January 2005.

continued

1998	1999	2000	2001	2002	2003	Total Growth 1990–2003
228.6	233.4	239.7	227.7	241.5	241.6	-25.9%
0.3	0.4	0.4	0.4	0.4	0.4	-41.4%
55,742.0	68,063.8	63,590.2	80,558.4	79,218.6	78,899.8	59.4%
1.6	1.3	1.3	1.4	1.2	1.3	-30.0%
13,683.5	13,183.8	12,826.1	9,689.7	8,104.4	7,059.3	-55.7%
0.9	0.9	0.8	0.5	0.7	0.8	-33.9%
2.6	2.5	2.1	1.7	1.6	1.6	-60.6%
2.5	1.7	1.4	1.4	1.3	1.2	-63.3%
0.7	0.6	0.6	0.6	0.6	0.6	-30.7%
2.7	2.3	2.2	2.5	2.6	2.3	-40.4%
0.8	0.8	0.8	0.8	0.8	0.8	-15.3%
0.8	0.8	0.9	0.7	0.7	0.7	-44.3%
1.6	1.4	1.1	1.3	1.3	1.3	-39.8%
0.6	0.6	0.5	0.5	0.5	0.5	-43.5%
0.9	0.7	0.7	0.7	0.7	0.7	-24.7%
0.5	0.5	0.5	0.5	0.6	0.6	-36.3%
0.2	0.2	0.2	0.1	0.1	0.1	-76.2%
0.9	0.7	0.6	0.5	0.4	0.4	-57.0%
6,832.9	7,001.2	6,787.4	7,217.7	7,234.5	6,844.6	18.4%
1.4	1.4	1.5	1.4	1.5	1.9	-32.4%

Industrial Energy Prices and Background Indicators

	1990	1991–1996	1997	1998
Energy Prices by Energy Source (incl. taxes)				
Natural Gas (cents/m³) [a,e]	10.5		11.6	12.8
Light Fuel Oil (cents/litre) [a]	25.8		25.3	19.4
Heavy Fuel Oil (cents/litre) [a]	14.1		17.7	12.9
Electricity (1,000 kW/400,000 kWh) [1] (cents/kWh) [b,e]	5.7		7.1	7.1
Electricity (5,000 kW/3,060,000 kWh) [1] (cents/kWh) [b,e]	4.0		5.0	5.1
Background Indicators				
Business Sector Multifactor Measure of Productivity (1997 = 100) [d]	97.5		100.0	101.0
Industrial GDP (million $97) [d]	199,811		225,711	234,841
Industrial GO (million $97) [d]	517,528		624,030	645,170
Capacity Utilization Rate (%) [c]				
Mining	82.8		78.1	77.1
Manufacturing	78.2		83.6	84.3
Pulp and Paper	*83.7*		*90.4*	*86.1*
Primary Metals [2]	*85.1*		*89.0*	*93.8*
Petroleum Refining	*87.5*		*93.1*	*95.5*
Chemicals	*86.6*		*80.2*	*81.2*
Forestry	82.2		81.6	82.2
Construction	91.1		83.1	84.7
Industrial Employees (thousands) [d]				
Mining	193		185	180
Manufacturing	2,053		2,022	2,114
Pulp and Paper	*141*		*116*	*122*
Primary Metals [2]	*133*		*109*	*107*
Petroleum Refining	*25*		*21*	*19*
Chemicals	*106*		*99*	*109*
Forestry	74		83	84
Construction	817		730	739

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) kW refers to power hook-up, whereas kWh refers to monthly electricity consumption.
2) "Primary Metals" includes iron and steel, smelting and refining, and other primary metal activity.

Sources:
a) Statistics Canada, *Energy Statistics Handbook*, Ottawa, August 2004 (Cat. No. 57-601-XIE).
b) Calculated based on Hydro-Québec's *Comparison of Electricity Prices in Major North American Cities*, May 2003.
c) Statistics Canada, *Canadian Economic Observer Historical Statistical Supplement*, Ottawa, July 2004 (Cat No. 11-210-XIB).
d) Informetrica Limited, *TI Model Database and National Reference Forecast*, Ottawa, January 2005.
e) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).

1999	2000	2001	2002	2003	Total Growth 1990–2003
14.8	18.0	24.2	26.4	32.9	214.3%
24.0	40.1	35.6	34.7	38.6	50.1%
17.9	28.5	26.9	29.6	31.1	121.4%
7.1	6.9	7.6	7.5	8.0	40.5%
5.1	5.3	6.1	5.7	6.1	53.5%
103.4	106.0	106.4	109.1	109.6	
249,318	271,254	266,003	270,430	275,426	37.8%
700,286	785,780	776,782	806,265	806,163	55.8%
76.0	74.7	73.2	69.1	70.0	
85.9	86.0	81.7	83.2	83.0	
91.2	*92.1*	*88.6*	*90.6*	*91.4*	
91.1	*91.0*	*88.6*	*91.2*	*93.5*	
94.4	*92.4*	*94.9*	*96.5*	*96.8*	
80.9	*80.1*	*80.4*	*82.8*	*84.2*	
82.5	84.9	81.2	83.9	90.6	
86.8	87.2	89.1	87.0	86.2	
156	163	187	169	182	-5.8%
2,217	2,280	2,275	2,326	2,294	11.8%
117	*116*	*111*	*109*	*110*	*-22.2%*
106	*109*	*101*	*104*	*98*	*-26.1%*
17	*20*	*17*	*17*	*16*	*-34.7%*
113	*120*	*121*	*126*	*121*	*13.8%*
80	89	78	75	79	6.8%
775	816	843	882	931	14.0%

Chapter 5
Transportation Sector

The Data Situation

The aggregate data on transportation energy use by energy source are from Statistics Canada's *Report on Energy Supply-Demand in Canada* (RESD) (Cat. No. 57-003-XIB). Other sources with more specific data enable the Office of Energy Efficiency (OEE) to allocate energy use by transportation mode. Using the stock, fuel efficiencies and average distance travelled, the Transportation End-Use Model (TEUM) calculates preliminary estimates for road energy use by vehicle type. Then using origin and destination shipment data from Statistics Canada's *Trucking in Canada* (Cat. No. 53-222-XIE), TEUM takes into account the fact that heavy truck vehicles do not necessarily travel or purchase fuel in the province where they are registered. Final road energy use estimates are calibrated to match RESD road information.

Aggregate non-road energy use data (rail, air and marine) are obtained directly from RESD. Rail and air are further disaggregated into passenger and freight transportation using Statistics Canada's *Rail in Canada* (Cat. No. 52-216-XIE) and *Canadian Civil Aviation* (Cat. No. 51-206-XIB). The *Climate Change Air Sub-Group Report* by Sypher Mueller International Inc., July 1999, is also used in the allocation of air energy use to passenger and freight modes.

Data for vehicle stock in TEUM are obtained from R.L. Polk Canada Inc., R.L. Polk & Co. and DesRosiers Automotive Consultants Inc. in the form of two databases: *Canadian Vehicles in Operation Census* (CVIOC) and *Trucking Industry Profile* (TIP). Statistics Canada's *Road Motor Vehicles, Registrations* (Cat. No. 53-219-XIB) and *Canadian Vehicle Survey* (CVS) (Cat. No. 53-223-XIE) are used for years in which CVIOC and/or TIP were not available. Differences from last year's database in the allocation of energy use between passenger and freight transportation are due to the following: revisions to the TIP data sets for 2001 and 2002; and revisions to the share of light trucks used for personal purposes in older model years. The bus information is further disaggregated by bus type using Statistics Canada's *Passenger Bus and Urban Transit Statistics* (PBS) (Cat. No. 53-215-XIB).

Laboratory-tested fuel efficiencies for new cars and light trucks are calculated using Transport Canada's *Vehicle Fuel Economy Information System*. However, no national data sources are available for on-road efficiencies. The OEE, through the National Energy Use Database, has been working with Transport Canada and Statistics Canada to address this issue. The collection of on-road fuel consumption data through CVS for all vehicle types except buses started on January 1, 2004. Survey results are expected in the 2005–2006 fiscal year. On-road fuel efficiency for buses is based on PBS.

The *National Private Vehicle Use Survey – October 1994 to September 1996* (conducted by Statistics Canada on behalf of Natural Resources Canada) and CVS provided average distances travelled for cars and trucks. To be more consistent with the survey data collected since 1995, heavy truck average distance travelled was revised prior to 1994. Motorcycle estimates are calculated based on information from the United States' Department of Transportation.

Occupancy rates are essential for calculating the passenger-kilometres travelled for cars and light trucks. Previously, they were based on information from *Getting There: The Interim Report of the Royal Commission on National Passenger Transportation*, April 1991. Since 1999, occupancy rates have been obtained from CVS data. This year – using observed trends in CVS, seatbelt survey data gathered by Transport Canada, total population and vehicle stock – new historical series were built for cars and light trucks. Motorcycle occupancy rates are based on U.S. Department of Transportation data. Finally, bus occupancy rates are taken from CVS and PBS. Non-road passenger-kilometres are taken from *Rail in Canada* and *Canadian Civil Aviation* for rail and air, respectively.

Light truck and medium truck tonne-kilometres are calculated using a TEUM assumption on load factor. Heavy truck tonne-kilometres are from *Trucking in Canada*, and non-road tonne-kilometres are taken from *Canadian Civil Aviation*, *Rail in Canada* and Transport Canada's Surface and Marine Statistics and Forecasts Division for air, rail and marine, respectively.

Transportation energy prices are weighted averages of regional prices from Statistics Canada's *Energy Statistics Handbook* (Cat. No. 57-601-XIE). Other transportation indicators are from Informetrica Limited's *TI Model and National Reference Forecast*.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Transportation Secondary Energy Use by Energy Source and Transportation Mode

	1990	1991–1996	1997	1998
Total Energy Use (PJ)[a]	**1,877.9**		**2,117.2**	**2,194.5**
Passenger Transportation[1]	1,149.2		1,225.0	1,269.5
Freight Transportation[b]	675.3		825.1	854.4
Off-Road[b]	53.3		67.1	70.6
Energy Use by Energy Source (PJ)[a]				
Electricity	3.1		3.0	2.9
Natural Gas	1.7		2.6	2.5
Motor Gasoline	1,120.4		1,213.1	1,261.4
Diesel Fuel Oil	469.8		599.0	599.1
Light Fuel Oil and Kerosene	0.0		0.0	0.0
Heavy Fuel Oil	60.1		56.7	74.8
Aviation Gasoline	5.5		3.7	3.9
Aviation Turbo Fuel	181.9		210.9	222.8
Propane	35.4		28.3	27.0
Energy Use by Transportation Mode (PJ)[a]				
Small Cars	302.8		327.2	331.4
Large Cars	340.5		310.6	311.1
Passenger Light Trucks	269.2		329.2	355.8
Freight Light Trucks	131.6		150.9	161.1
Medium Trucks	123.1		138.0	142.2
Heavy Trucks	222.0		348.9	347.2
Motorcycles	1.9		1.9	2.1
School Buses	13.6		16.1	18.3
Urban Transit	27.7		25.2	25.6
Inter-City Buses	8.6		7.0	6.7
Passenger Air	180.2		205.4	216.1
Freight Air	7.3		9.2	10.6
Passenger Rail	4.7		2.3	2.4
Freight Rail	84.7		77.9	74.2
Marine	106.5		100.1	119.2
Off-Road	53.3		67.1	70.6
Activity				
Total Passenger-kilometres[1] (millions)[b]	444,725		523,392	537,162
Total Tonne-kilometres (millions)[b]	546,795		668,919	675,844
Passenger Transportation Energy Intensity[1] (MJ/Pkm)[b]	**2.58**		**2.28**	**2.31**
Freight Transportation Energy Intensity (MJ/Tkm)[b]	**1.24**		**1.23**	**1.26**

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Excludes non-commercial aviation.

Sources:
a) Statistics Canada, *Report on Energy Supply-Demand in Canada,1990–2003*, Ottawa, September 2004 (CANSIM)
b) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
2,252.8	2,281.9	2,277.3	2,306.2	2,361.3	25.7%
1,307.6	1,302.6	1,283.5	1,307.3	1,322.4	15.1%
869.6	899.2	904.6	907.4	945.8	40.1%
75.6	80.0	89.2	91.5	93.1	74.4%
3.0	3.1	3.1	3.4	3.4	9.2%
2.2	2.4	2.0	1.7	1.7	5.2%
1,293.4	1,295.1	1,308.7	1,333.4	1,354.5	20.9%
628.2	658.3	650.4	662.4	697.5	48.5%
0.0	0.0	0.0	0.0	0.0	–
65.9	67.8	77.5	64.8	66.8	11.1%
3.6	3.4	3.5	3.5	3.2	42.2%
233.9	235.9	215.1	224.6	222.5	22.3%
22.6	15.9	17.0	12.4	11.7	-66.9%
336.4	329.9	325.9	327.5	331.7	9.5%
314.4	307.0	303.9	304.1	309.8	-9.0%
372.9	380.0	390.5	404.6	411.4	52.8%
166.0	165.8	170.9	174.2	177.4	34.8%
133.7	134.1	134.2	138.7	142.2	15.5%
368.8	393.0	385.6	398.8	438.2	97.4%
2.1	2.2	2.2	2.4	2.6	38.6%
19.1	19.1	17.7	16.3	16.4	20.7%
26.8	27.6	27.0	28.7	29.4	6.1%
6.9	6.8	6.9	6.6	6.6	-23.1%
226.3	227.1	206.6	214.4	211.9	17.6%
11.3	12.2	12.0	13.7	13.8	89.6%
2.7	2.9	2.9	2.6	2.6	-45.2%
78.4	80.2	78.8	71.5	71.2	-15.9%
111.5	114.0	123.2	110.5	103.1	-3.2%
75.6	80.0	89.2	91.5	93.1	74.4%
550,653	553,756	541,998	555,621	565,549	27.2%
700,997	732,207	726,851	764,722	796,791	45.7%
2.32	**2.30**	**2.31**	**2.30**	**2.29**	**-8.2%**
1.24	**1.23**	**1.24**	**1.19**	**1.19**	**-3.9%**

Transportation GHG Emissions by Energy Source and Transportation Mode

	1990	1991–1996	1997	1998
Total GHG Emissions (Mt)**	135.0		152.1	156.8
Passenger Transportation**	81.9		87.4	89.6
Freight Transportation**	49.4		60.0	62.3
Off-Road**	3.7		4.7	4.9
GHG Emissions by Energy Source (Mt)*				
Electricity	0.2		0.2	0.2
Natural Gas	0.1		0.1	0.1
Motor Gasoline	80.0		86.7	89.3
Diesel Fuel Oil	34.6		43.7	44.1
Light Fuel Oil and Kerosene	0.0		0.0	0.0
Heavy Fuel Oil	4.5		4.2	5.5
Aviation Gasoline	0.4		0.3	0.3
Aviation Turbo Fuel	13.2		15.2	15.7
Propane	2.1		1.7	1.6
GHG Emissions by Transportation Mode (Mt)*				
Small Cars	21.4		23.1	23.2
Large Cars	24.1		22.0	21.8
Passenger Light Trucks	19.4		23.8	25.5
Freight Light Trucks	9.3		10.7	11.4
Medium Trucks	8.9		9.9	10.2
Heavy Trucks	15.8		24.9	25.0
Motorcycles	0.1		0.1	0.1
School Buses	0.9		1.1	1.3
Urban Transit	1.9		1.7	1.8
Inter-City Buses	0.6		0.5	0.5
Passenger Air	13.0		14.9	15.2
Freight Air	0.5		0.7	0.7
Passenger Rail	0.4		0.2	0.2
Freight Rail	6.7		6.2	6.0
Marine	8.1		7.7	9.0
Off-Road	3.7		4.7	4.9
GHG Intensity (tonne/TJ)**	71.9		71.5	71.5
GHG Emissions Related to Electricity (Mt)**	0.2		0.2	0.2

1991–1996 data available at oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM)

b) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005

c) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E)

1999	2000	2001	2002	2003	Total Growth 1990–2003
161.0	163.2	162.9	164.9	168.8	25.0%
92.3	92.0	90.7	92.4	93.5	14.1%
63.5	65.7	66.1	66.2	68.9	39.5%
5.3	5.6	6.2	6.4	6.5	72.7%
0.2	0.2	0.2	0.2	0.2	23.9%
0.1	0.1	0.1	0.1	0.1	4.0%
91.6	91.7	92.7	94.5	95.9	19.9%
46.2	48.4	47.9	48.7	51.1	47.8%
0.0	0.0	0.0	0.0	0.0	–
4.8	5.0	5.7	4.8	4.9	9.1%
0.3	0.3	0.3	0.3	0.2	-42.2%
16.4	16.6	15.1	15.8	15.6	18.9%
1.4	1.0	1.0	0.7	0.7	-66.6%
23.6	23.1	22.9	23.0	23.3	8.7%
22.0	21.5	21.3	21.3	21.7	-9.7%
26.7	27.2	28.0	29.0	29.5	51.7%
11.8	11.8	12.1	12.4	12.7	36.2%
9.6	9.7	9.7	10.0	10.2	15.5%
26.6	28.3	27.8	28.7	31.5	99.3%
0.1	0.2	0.2	0.2	0.2	37.2%
1.3	1.3	1.2	1.1	1.2	22.7%
1.9	1.9	1.9	2.0	2.1	7.5%
0.5	0.5	0.5	0.5	0.5	-22.4%
15.9	16.0	14.5	15.1	14.9	14.4%
0.8	0.9	0.8	1.0	1.0	84.4%
0.2	0.2	0.2	0.2	0.2	-44.6%
6.3	6.4	6.3	5.7	5.7	-15.1%
8.5	8.6	9.3	8.4	7.8	-4.4%
5.3	5.6	6.2	6.4	6.5	72.7%
71.5	71.5	71.5	71.5	71.5	-0.6%
0.2	0.2	0.2	0.2	0.2	23.9%

Transportation Energy Prices and Background Indicators

	1990	1991–1996	1997	1998
Energy Prices by Energy Source (incl. taxes)				
Regular Unleaded Gasoline[1] (cents/litre)[a,b,c]	58.7		59.4	54.2
Diesel Fuel Oil[1] (cents/litre)[a,b,c]	51.3		54.1	52.4
Propane (cents/litre)[a,c]	26.6		31.5	29.2
Excise Tax (cents/litre)[b]				
Unleaded Gasoline	8.5		10.0	10.0
Leaded Gasoline	9.5		11.0	11.0
Diesel Fuel Oil	4.0		4.0	4.0
Background Indicators				
Consumer Price Index (1992 = 100)[d]				
Gasoline and Other Fuels[2]	105.3		108.4	99.1
Public Transportation	86.2		132.2	139.8
Inter-City Transportation	88.6		142.3	152.6
Local and Commuter	83.3		119.5	121.6
GDP at Factor Cost (million $97)[d]				
Business Sector	572,593		679,522	710,535
Transportation	32,783		39,179	39,889
Real Personal Disposable Income per Household ($97)[e]	*52,583*		*48,642*	*49,270*

1991–1996 data available at oee.nrcan.gc.ca/handbook05

1) Price at full-service stations.
2) "Other Fuels" includes diesel fuel oil, propane, natural gas and any other fuel that would be used for automobile propulsion.

Sources:
a) Statistics Canada, *Energy Statistics Handbook*, Ottawa, August 2004 (Cat. No. 57-601-XIE).
b) Canada Customs and Revenue Agency, *Current Rates of Excise Taxes*, Ottawa, November 2004.
c) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.
d) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).
e) Statistics Canada, *Total Population, Census Divisions and Census Metropolitan Areas*, Tables 051-0014 and 051-0034, Ottawa, December 2004 (CANSIM).

1999	2000	2001	2002	2003	Total Growth 1990–2003
59.4	72.6	70.7	70.5	75.0	27.8%
52.8	66.5	67.0	61.8	67.3	31.1%
30.9	43.0	45.0	37.3	50.2	88.5%
10.0	10.0	10.0	10.0	10.0	17.6%
11.0	11.0	11.0	11.0	11.0	15.8%
4.0	4.0	4.0	4.0	4.0	0.0%
108.0	131.7	128.3	127.2	135.4	
148.0	152.9	156.1	164.9	169.7	
166.8	172.3	174.1	187.1	191.5	
124.4	128.6	133.4	136.9	142.3	
754,069	800,595	812,561	840,638	860,541	50.3%
42,315	44,344	45,326	46,062	46,195	40.9%
50,123	*51,974*	*52,536*	*52,751*	*52,851*	*0.5%*

Passenger Transportation Secondary Energy Use by Energy Source and Transportation Mode

	1990	1991–1996	1997	1998
Passenger Transportation Energy Use (PJ) [a]	**1,149.2**		**1,225.0**	**1,269.5**
Energy Use by Energy Source (PJ) [a]				
Electricity	3.1		3.0	2.9
Natural Gas	1.6		2.4	2.4
Motor Gasoline	893.4		950.7	984.1
Diesel Fuel Oil	53.9		50.1	50.6
Aviation Gasoline	5.4		3.7	3.8
Aviation Turbo Fuel	174.7		201.7	212.3
Propane	17.1		13.4	13.4
Energy Use by Transportation Mode (PJ) [a]				
Small Cars	302.8		327.2	331.4
Large Cars	340.5		310.6	311.1
Light Trucks	269.2		329.2	355.8
Motorcycles	1.9		1.9	2.1
School Buses	13.6		16.1	18.3
Urban Transit	27.7		25.2	25.6
Inter-City Buses	8.6		7.0	6.7
Air	180.2		205.4	216.1
Rail	4.7		2.3	2.4
Activity				
Total Passenger-kilometres [1] (millions) [a,b,c]	444,725		523,392	537,162
Passenger-kilometres by Transportation Mode (millions)				
Small Cars [a]	144,046		160,295	159,955
Large Cars [a]	114,492		117,364	116,615
Light Trucks [a]	78,129		108,818	116,778
Motorcycles [a]	1,442		1,302	1,338
School Buses [a]	15,126		21,313	24,520
Urban Transit [a]	14,390		13,167	12,487
Inter-City Buses [a]	8,544		7,759	7,369
Air [b,c]	66,776		91,859	96,642
Rail [c]	1,782		1,515	1,458
Energy Intensity [1] (MJ/Pkm) [a,b,c]	**2.58**		**2.28**	**2.31**

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Excludes non-commercial aviation.

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

b) Statistics Canada, *Canadian Civil Aviation, 1990–2000*, Ottawa, February 2003 (Cat. No. 51-206-XIB). Data for 2001 to 2003 estimated by Natural Resources Canada.

c) Statistics Canada, *Rail in Canada 1990–2001*, Ottawa, December 2003 (Cat. No. 52-216-XIE). Data for 2002 and 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1999–2003
1,307.6	1,302.6	1,283.5	1,307.3	1,322.4	15.1%
3.0	3.1	3.1	3.4	3.4	9.2%
2.1	2.3	1.9	1.7	1.7	5.3%
1,011.1	1,007.0	1,009.0	1,026.7	1,043.3	16.8%
53.4	54.6	53.9	54.6	55.9	3.8%
3.5	3.4	3.5	3.4	3.1	-42.6%
222.7	223.7	203.2	211.0	208.8	19.5%
11.7	8.5	9.0	6.6	6.3	-63.5%
336.4	329.9	325.9	327.5	331.7	9.5%
314.4	307.0	303.9	304.1	309.8	-9.0%
372.9	380.0	390.5	404.6	411.4	52.8%
2.1	2.2	2.2	2.4	2.6	38.6%
19.1	19.1	17.7	16.3	16.4	20.7%
26.8	27.6	27.0	28.7	29.4	6.1%
6.9	6.8	6.9	6.6	6.6	-23.1%
226.3	227.1	206.6	214.4	211.9	17.6%
2.7	2.9	2.9	2.6	2.6	-45.2%
550,653	553,756	541,998	555,621	565,549	27.2%
161,435	158,601	157,578	159,237	161,585	12.2%
117,703	115,814	115,368	116,669	119,036	4.0%
122,286	124,209	128,071	132,964	135,268	73.1%
1,437	1,501	1,623	1,852	2,010	39.4%
26,280	26,858	23,953	22,384	22,909	51.5%
13,671	13,708	13,276	14,365	14,833	3.1%
6,712	6,626	6,820	7,023	7,126	-16.6%
99,618	104,906	93,756	99,530	101,234	51.6%
1,510	1,533	1,553	1,597	1,608	-9.8%
2.32	2.30	2.31	2.30	2.29	-8.2%

Passenger Transportation GHG Emissions by Energy Source and Transportation Mode

	1990	1991–1996	1997	1998
Passenger Transportation GHG Emissions (Mt)[b,c]	**81.9**		**87.4**	**89.6**
GHG Emissions by Energy Source (Mt)[b,c]				
Electricity	0.2		0.2	0.2
Natural Gas	0.1		0.1	0.1
Motor Gasoline	63.7		67.9	69.6
Diesel Fuel Oil	3.9		3.6	3.7
Aviation Gasoline	0.4		0.3	0.3
Aviation Turbo Fuel	12.6		14.6	14.9
Propane	1.0		0.8	0.8
GHG Emissions by Transportation Mode (Mt)[b,c]				
Small Cars	21.4		23.1	23.2
Large Cars	24.1		22.0	21.8
Light Trucks	19.4		23.8	25.5
Motorcycles	0.1		0.1	0.1
School Buses	0.9		1.1	1.3
Urban Transit	1.9		1.7	1.8
Inter-City Buses	0.6		0.5	0.5
Air	13.0		14.9	15.2
Rail	0.4		0.2	0.2
GHG Intensity (tonne/TJ)[b,c]	**71.3**		**71.4**	**70.6**
GHG Emissions Related to Electricity (Mt)[a,c]	**0.2**		**0.2**	**0.2**

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990-2003*, Ottawa, September 2004 (CANSIM).

b) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

c) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990-2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
92.3	**92.0**	**90.7**	**92.4**	**93.5**	**14.1%**
0.2	0.2	0.2	0.2	0.2	23.9%
0.1	0.1	0.1	0.1	0.1	4.2%
71.5	71.2	71.4	72.7	73.8	15.9%
3.9	4.0	3.9	4.0	4.1	4.4%
0.3	0.2	0.3	0.2	0.2	-42.6%
15.7	15.7	14.3	14.8	14.7	16.2%
0.7	0.5	0.5	0.4	0.4	-63.2%
23.6	23.1	22.9	23.0	23.3	8.7%
22.0	21.5	21.3	21.3	21.7	-9.7%
26.7	27.2	28.0	29.0	29.5	51.7%
0.1	0.2	0.2	0.2	0.2	37.2%
1.3	1.3	1.2	1.1	1.2	22.7%
1.9	1.9	1.9	2.0	2.1	7.5%
0.5	0.5	0.5	0.5	0.5	-22.4%
15.9	16.0	14.5	15.1	14.9	14.4%
0.2	0.2	0.2	0.2	0.2	-44.6%
70.6	**70.6**	**70.6**	**70.7**	**70.7**	**-0.8%**
0.2	**0.2**	**0.2**	**0.2**	**0.2**	**23.9%**

Passenger Road Transportation Secondary Energy Use and GHG Emissions by Energy Source

	1990	1991 - 1996	1997	1998
Passenger Road Transportation Energy Use (PJ)*	**964.3**		**1,017.3**	**1,051.0**
Energy Use by Energy Source (PJ)*				
Electricity	3.1		3.0	2.9
Natural Gas	1.6		2.4	2.4
Motor Gasoline	893.4		950.7	984.1
Diesel Fuel Oil	49.1		47.8	48.2
Propane	17.1		13.4	13.4
Activity				
Passenger-kilometres (millions)[a]	376,167		430,018	439,062
Energy Intensity (MJ/Pkm)*	**2.56**		**2.37**	**2.39**
Passenger Road Transportation GHG Emissions (Mt)**	**68.5**		**72.4**	**74.2**
GHG Emissions by Energy Source (Mt)*				
Electricity	0.2		0.2	0.2
Natural Gas	0.1		0.1	0.1
Motor Gasoline	63.7		67.9	69.6
Diesel Fuel Oil	3.5		3.4	3.5
Propane	1.0		0.8	0.8
GHG Intensity (tonne/TJ)**	**71.0**		**71.1**	**70.6**

1991 - 1996 data available at: oee.nrcan.gc.ca/handbook09

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

b) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990 - 2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
1,078.7	**1,072.7**	**1,074.1**	**1,090.3**	**1,107.9**	**14.9%**
3.0	3.1	3.1	3.4	3.4	9.2%
2.1	2.3	1.9	1.7	1.7	5.3%
1,011.1	1,007.0	1,009.0	1,026.7	1,043.3	16.8%
50.7	51.7	51.1	52.0	53.3	8.6%
11.7	8.5	9.0	6.6	6.3	-63.5%
449,525	447,317	446,689	454,494	462,707	23.0%
2.40	**2.40**	**2.40**	**2.40**	**2.39**	**-6.6%**
76.2	**75.8**	**75.9**	**77.1**	**78.4**	**14.4%**
0.2	0.2	0.2	0.2	0.2	23.9%
0.1	0.1	0.1	0.1	0.1	4.2%
71.5	71.2	71.4	72.7	73.8	15.9%
3.7	3.7	3.7	3.8	3.9	9.6%
0.7	0.5	0.5	0.4	0.4	-63.2%
70.6	**70.7**	**70.7**	**70.7**	**70.7**	**-0.5%**

Passenger Transportation Explanatory Variables

	1990	1991–1996	1997	1998
Light-Duty Vehicles				
Sales (thousands)				
Small Cars [a,f]	514		413	421
Large Cars [a,f]	357		311	319
Light Trucks [a,f]	337		524	551
Motorcycles	n.a.		n.a.	n.a.
Stock (thousands)				
Small Cars [a]	5,935		6,026	6,083
Large Cars [a]	4,801		4,507	4,537
Light Trucks [a]	3,406		3,782	4,084
Motorcycles [a]	306		275	289
Average Distance Travelled per Year (km)				
Small Cars [a]	15,669		16,905	16,692
Large Cars [a]	15,395		16,549	16,316
Light Trucks [a]	14,748		17,017	16,846
Motorcycles [a]	3,774		4,343	4,331
On-Road Average Fuel Consumption (L/100 km)				
Small Cars [a,g]				
Motor Gasoline	*9.4*		*9.3*	*9.3*
Diesel Fuel Oil	*7.8*		*8.2*	*8.2*
Large Cars [a,g]				
Motor Gasoline	*13.3*		*12.0*	*12.0*
Diesel Fuel Oil	*11.1*		*10.6*	*10.6*
Light Trucks [a,g]				
Motor Gasoline	*15.4*		*14.7*	*14.8*
Diesel Fuel Oil	*15.2*		*13.4*	*13.4*
Motorcycles [a,g]				
Motor Gasoline	*4.7*		*4.7*	*4.7*

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

b) Statistics Canada, *Passenger Bus and Urban Transit Statistics 1990–2000*, Ottawa, July 2002 (Cat. No. 53-215-XIB). Data for 2001 to 2003 estimated by Natural Resources Canada.

c) Statistics Canada, *Road Motor Vehicle Registrations*, Ottawa, November 1999 (Cat. No. 53-219-XIB). Statistics Canada, *Motor Vehicle Registrations 2000–2003*, Table 405-0004, Ottawa, September 2004 (CANSIM).

d) Statistics Canada, *New Motor Vehicle Sales 1990–2003*, Table 079-0001, Ottawa, November 2004 (CANSIM).

e) U.S. Department of Transportation, *National Transportation Statistics*, Table 4-1, 2004.

f) DesRosiers Automotive Consultants, *Canadian Vehicle in Operation Census 1990–2003*, Richmond Hill (Toronto), November 2004.

g) Transport Canada, *Vehicle Fuel Economy Information System 1979–2001*, Ottawa, October 2003. Model years 2002 and 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
447	481	490	520	491	-4.4%
342	367	376	399	375	5.1%
542	552	514	562	541	60.6%
n.a.	n.a.	n.a.	n.a.	n.a.	–
6,110	6,044	6,161	6,243	6,344	6.9%
4,559	4,487	4,569	4,598	4,685	-2.4%
4,246	4,379	4,614	4,794	4,872	43.1%
298	311	318	350	373	22.2%
16,757	16,624	16,239	16,143	16,068	2.5%
16,373	16,350	16,031	16,060	16,030	4.1%
16,903	16,685	16,328	16,315	16,326	10.7%
4,381	4,345	4,180	4,166	4,239	12.3%
9.4	*9.4*	*9.3*	*9.3*	*9.3*	*-1.2%*
8.3	*8.2*	*8.0*	*7.9*	*7.9*	*0.8%*
12.0	*12.0*	*11.9*	*11.8*	*11.8*	*-11.4%*
10.5	*10.4*	*10.2*	*10.1*	*10.0*	*-9.6%*
14.8	*14.9*	*14.8*	*14.8*	*14.8*	*-4.2%*
13.4	*13.5*	*13.3*	*13.1*	*13.1*	*-13.4%*
4.7	*4.7*	*4.7*	*4.7*	*4.7*	*0.0%*

continued ——

Passenger Transportation Explanatory Variables *(continued)*

	1990	1991–1996	1997	1998
Lab-Tested New Vehicle Fuel Consumption[1] (L/100 km)*				
CAFC Standard Cars	8.6		8.6	8.6
CAFC Average Car Fleet	8.2		8.0	7.9
CAFC Standard Light Trucks	11.8		11.4	11.4
CAFC Average Light Truck Fleet	11.4		11.3	11.4
Buses				
Stock (thousands)*				
School Buses	44.8		49.3	50.4
Urban Transit	25.6		21.7	21.4
Inter-City Buses	6.6		6.2	6.1
Average Distance Travelled per Year (km)**^				
School Buses	19,633		22,938	25,536
Urban Transit	53,497		57,529	55,285
Inter-City Buses	76,910		73,837	71,300

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Those series are representatives of vehicles produced in the model year, not for vehicles sold in that calendar year.

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
b) Statistics Canada, *Passenger Bus and Urban Transit Statistics 1990–2000*, Ottawa, July 2002 (Cat. No. 53-215-XIB). Data for 2001 to 2003 estimated by Natural Resources Canada.
c) Statistics Canada, *Road Motor Vehicle Registrations*, Ottawa, November 1999 (Cat. No. 53-219-XIB). Statistics Canada, *Motor Vehicle Registrations 2000–2003*, Table 405-0004, Ottawa, September 2004 (CANSIM).
d) Statistics Canada, *New Motor Vehicle Sales 1990–2003*, Table 079-0001, Ottawa, November 2004 (CANSIM).
e) U.S. Department of Transportation, *National Transportation Statistics*, Table 4-1, 2004.
f) DesRosiers Automotive Consultants, *Canadian Vehicle in Operation Census 1990–2003*, Richmond Hill (Toronto), November 2004.
g) Transport Canada, *Vehicle Fuel Economy Information System 1979–2001*, Ottawa, October 2003. Model years 2002 and 2003 estimated by Natural Resources Canada.

continued →

1999	2000	2001	2002	2003	Total Growth 1990–2003
8.6	8.6	8.6	8.6	8.6	0.0%
7.9	7.7	7.7	7.8	7.6	-7.3%
11.4	11.4	11.4	11.4	11.4	-3.4%
11.3	11.1	11.0	11.1	10.7	-6.1%
50.4	49.3	44.5	44.8	45.5	1.6%
22.7	22.7	24.1	25.4	25.7	0.5%
5.5	5.3	5.5	5.8	5.9	-10.9%
27,045	27,912	27,271	24,942	24,933	27.0%
56,991	57,203	52,217	53,562	54,635	2.1%
72,895	73,548	73,177	71,845	72,013	-6.4%

Freight Transportation Secondary Energy Use by Energy Source and Transportation Mode

	1990	1991–1996	1997	1998
Freight Transportation Energy Use (PJ)	675.3		825.1	800.1
Energy Use by Energy Source (PJ)				
Natural Gas	0.1		0.2	0.1
Motor Gasoline	173.7		195.3	206.7
Diesel Fuel Oil	415.9		548.9	548.5
Light Fuel Oil and Kerosene	0.0		0.0	0.0
Heavy Fuel Oil	60.1		56.7	74.8
Aviation Gasoline	0.1		0.0	0.0
Aviation Turbo Fuel	7.2		9.2	10.5
Propane	18.2		14.8	13.6
Energy Use by Transportation Mode (PJ)				
Light Trucks	131.6		150.9	161.1
Medium Trucks	123.1		138.0	142.2
Heavy Trucks	222.0		348.9	347.2
Air	7.3		9.2	10.6
Rail	84.7		77.9	74.2
Marine	106.5		100.1	119.2
Activity				
Total Tonne-kilometres (millions)	546,795		668,919	675,844
Tonne-kilometres by Transportation Mode (millions)				
Light Trucks	11,908		14,471	15,292
Medium Trucks	16,846		19,609	20,351
Heavy Trucks	77,800		130,141	137,552
Air	1,754		2,371	2,292
Rail	248,371		306,198	298,797
Marine	190,115		196,129	201,560
Energy Intensity (MJ/Tkm)	1.24		1.23	1.26

1991–1996 data available at oee.nrcan.gc.ca/handbook05

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

b) Statistics Canada, *Trucking in Canada 1990–2002*, Ottawa, April 2004 (Cat. No. 53-222-XIB).
Data for 2003 estimated by Natural Resources Canada.

c) Statistics Canada, *Canadian Civil Aviation, 1990–2000*, Ottawa, February 2003 (Cat. No. 51-206-XIB).
Data for 2001 to 2003 estimated by Natural Resources Canada.

d) Statistics Canada, *Rail in Canada 1990–2001*, Ottawa, December 2003 (Cat. No. 52-216-XIE).
Data for 2002 and 2003 estimated by Natural Resources Canada.

e) Transport Canada, Surface and Marine Statistics and Forecasts Division, Ottawa, January 2005.

1999	2000	2001	2002	2003	Total Growth 1990–2003
869.6	899.2	904.6	907.4	945.8	40.1%
0.1	0.1	0.1	0.1	0.1	2.4%
206.7	208.0	210.5	215.2	218.2	25.6%
574.7	603.7	596.5	607.8	641.5	54.2%
0.0	0.0	0.0	0.0	0.0	–
65.9	67.8	77.5	64.8	66.8	11.1%
0.0	0.0	0.1	0.1	0.1	-17.0%
11.2	12.2	11.9	13.6	13.7	90.7%
10.9	7.4	8.0	5.8	5.4	-70.2%
166.0	165.8	170.9	174.2	177.4	34.8%
133.7	134.1	134.2	138.7	142.2	15.5%
368.8	393.0	385.6	398.8	438.2	97.4%
11.3	12.2	12.0	13.7	13.8	89.6%
78.4	80.2	78.8	71.5	71.2	-15.9%
111.5	114.0	123.2	110.5	103.1	-3.2%
700,997	732,207	726,851	764,722	796,791	45.7%
15,688	15,659	16,178	16,525	16,810	41.2%
19,297	19,461	19,532	20,276	20,868	23.9%
158,104	164,720	170,569	177,012	186,343	152.4%
2,365	2,329	2,311	2,660	2,705	54.2%
297,504	319,769	318,264	320,556	322,664	29.9%
208,039	210,269	199,997	227,694	237,400	24.9%
1.24	1.23	1.24	1.19	1.19	-3.9%

Freight Transportation GHG Emissions by Energy Source and Transportation Mode

	1990	1991–1996	1997	1998
Freight Transportation GHG Emissions (Mt)**	49.4		60.0	62.3
GHG Emissions by Energy Source (Mt)*				
Natural Gas	0.0		0.0	0.0
Motor Gasoline	12.6		14.1	14.8
Diesel Fuel Oil	30.7		40.1	40.4
Light Fuel Oil and Kerosene	0.0		0.0	0.0
Heavy Fuel Oil	4.5		4.2	5.5
Aviation Gasoline	0.0		0.0	0.0
Aviation Turbo Fuel	0.5		0.7	0.7
Propane	1.1		0.9	0.8
GHG Emissions by Transportation Mode (Mt)*				
Light Trucks	9.3		10.7	11.4
Medium Trucks	8.9		9.9	10.7
Heavy Trucks	15.8		24.9	25.0
Air	0.5		0.7	0.7
Rail	6.7		6.2	6.0
Marine	8.1		7.7	9.0
GHG Intensity (tonne/TJ)**	73.1		72.8	73.0

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

b) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
63.5	65.7	66.1	66.2	68.9	39.5%
0.0	0.0	0.0	0.0	0.0	1.3%
14.8	14.9	15.1	15.4	15.6	24.4%
42.4	44.5	43.9	44.7	47.0	53.3%
0.0	0.0	0.0	0.0	0.0	--
4.8	5.0	5.7	4.8	4.9	9.1%
0.0	0.0	0.0	0.0	0.0	-17.0%
0.8	0.9	0.8	1.0	1.0	85.5%
0.7	0.4	0.5	0.3	0.3	-69.9%
11.8	11.8	12.1	12.4	12.7	36.2%
9.6	9.7	9.7	10.0	10.2	15.5%
26.6	28.3	27.8	28.7	31.5	99.3%
0.8	0.9	0.8	1.0	1.0	84.4%
6.3	6.4	6.3	5.7	5.7	-15.1%
8.5	8.6	9.3	8.4	7.8	-4.4%
73.0	73.0	73.0	73.0	72.8	-0.4%

Freight Road Transportation Secondary Energy Use and GHG Emissions by Energy Source

	1990	1991–1996	1997	1998
Freight Road Transportation Energy Use (PJ)*	**476.8**		**637.9**	**650.5**
Energy Use by Energy Source (PJ)*				
Natural Gas	0.1		0.2	0.1
Motor Gasoline	173.7		195.3	206.7
Diesel Fuel Oil	284.8		427.6	430.0
Propane	18.2		14.8	13.6
Activity				
Tonne-kilometres (millions)[c]	106,555		164,221	173,195
Energy Intensity (MJ/Tkm)*	**4.47**		**3.88**	**3.76**
Freight Road Transportation GHG Emissions (Mt)**	**34.0**		**45.5**	**46.6**
GHG Emissions by Energy Source (Mt)*				
Natural Gas	0.0		0.0	0.0
Motor Gasoline	12.6		14.1	14.8
Diesel Fuel Oil	20.3		30.5	31.0
Propane	1.1		0.9	0.8
GHG Intensity (tonne/TJ)**	**71.3**		**71.4**	**71.7**

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.

b) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990-2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
668.4	692.8	690.6	711.8	757.8	58.9%
0.1	0.1	0.1	0.1	0.1	2.4%
206.7	208.0	210.5	215.2	218.2	25.6%
450.8	477.3	472.1	490.6	534.0	87.5%
10.9	7.4	8.0	5.8	5.4	-70.2%
193,089	199,840	206,279	213,813	234,022	119.6%
3.46	3.47	3.35	3.33	3.24	-27.6%
47.9	49.7	49.6	51.1	54.4	60.2%
0.0	0.0	0.0	0.0	0.0	1.3%
14.8	14.9	15.1	15.4	15.6	24.4%
32.5	34.4	34.0	35.3	38.5	89.4%
0.7	0.4	0.5	0.3	0.3	-69.9%
71.7	71.8	71.8	71.8	71.8	0.8%

Freight Transportation Explanatory Variables

	1990	1991–1996	1997	1998
Trucks				
Sales (thousands)				
Light Trucks[a,f]	106		169	172
Medium Trucks[a,f]	43		58	61
Heavy Trucks[a,f]	16		27	28
Stock (thousands)				
Light Trucks[a,f,g]	1,254		1,305	1,398
Medium Trucks[a,f]	577		654	688
Heavy Trucks[a,f]	256		295	316
Average Distance Travelled per Year (km)				
Light Trucks[a]	18,994		22,175	21,885
Medium Trucks[a,f]	23,350		23,980	23,677
Heavy Trucks[a]	62,942		68,952	69,065
On-Road Average Fuel Consumption (L/100 km)				
Light Trucks[a,g]				
Motor Gasoline	*15.8*		*14.9*	*15.0*
Diesel Fuel Oil	*15.6*		*13.6*	*13.7*
Medium Trucks[a]				
Motor Gasoline	*27.3*		*26.8*	*26.6*
Diesel Fuel Oil	*22.8*		*21.9*	*21.8*
Heavy Trucks[a]				
Diesel Fuel Oil	*44.6*		*41.6*	*41.1*
Lab-Tested Light Truck Fuel Consumption[1] (L/100 km)[a]				
CAFC Standard Light Trucks	11.8		11.4	11.4
CAFC Average Light Truck Fleet	11.4		11.3	11.4

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) Those series are representatives of vehicles produced in the model year, not for vehicles sold in that calendar year.

Sources:

a) Natural Resources Canada, Transportation End-Use Model, Ottawa, February 2005.
b) R.L. Polk & Co., *New Vehicle Registrations 1990–2003*, Southfield (Detroit), Michigan, September 2004.
c) DesRosiers Automotive Consultants, *Canadian Vehicle in Operation Census 1990–2003*, Richmond Hill (Toronto), November 2004.
d) R.L. Polk & Co., *Truck Industry Profile 1994–2002*, Southfield (Detroit), Michigan, April 2004.
Data for 2003 estimated by Natural Resources Canada.
e) Statistics Canada, *Canadian Vehicle Survey, 1999–2003*, Ottawa, June 2004 (Cat. No. 53-223-XIE).
f) Statistics Canada, *New Motor Vehicle Sales 1990–2003*, Table 079-0001, Ottawa, December 2004 (CANSIM).
g) Transport Canada, *Vehicle Fuel Economy Information System 1979–2001*, Ottawa, October 2003.
Model years 2002 and 2003 estimated by Natural Resources Canada.

1999	2000	2001	2002	2003	Total Growth 1990–2003
167	172	155	169	163	53.3%
70	72	75	73	74	70.3%
32	29	22	25	24	48.5%
1,444	1,488	1,554	1,619	1,725	37.5%
621	618	630	656	661	14.6%
303	304	316	322	324	26.5%
21,731	21,042	20,819	20,414	19,494	2.6%
24,878	25,186	24,798	24,742	25,247	8.1%
72,859	73,486	70,941	70,428	71,377	13.4%
15.1	*15.1*	*15.0*	*15.0*	*15.0*	-5.1%
13.6	*13.7*	*13.4*	*13.3*	*13.3*	-14.7%
26.4	*26.2*	*26.2*	*26.1*	*26.0*	-5.0%
21.7	*21.6*	*21.6*	*21.6*	*21.5*	-5.5%
40.5	*40.2*	*40.0*	*39.8*	*39.6*	-11.2%
11.4	11.4	11.4	11.4	11.4	-3.4%
11.3	11.1	11.0	11.1	10.7	-6.1%

Chapter 6
Agriculture Sector

The Data Situation

Aggregate energy use data for the agriculture sector are reported in Statistics Canada's *Report on Energy Supply-Demand in Canada* (Cat. No. 57-003-XIB). Gross domestic product (GDP) data for the agriculture sector are provided by Informetrica Limited. Both data sets are reported based on the North American Industry Classification System.

Energy-related data in the agriculture sector are available only at an aggregate level. The data represent all energy use related to crop and animal production and their related support activities, as well as to hunting and trapping activities.

Unlike energy use data, the GDP data do not include support activities for crop and animal production. However, these support activities only make up a small proportion of total GDP.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Agriculture Secondary Energy Use and GHG Emissions by End-Use and Energy Source

	1990	1991–1996	1997	1998
Total Energy Use (PJ)[a]	**199.2**		**230.0**	**224.7**
Energy Use by End-Use (PJ)[a]				
Non-Motive Energy Use	71.6		84.7	78.4
Motive Energy Use[1]	127.6		145.3	146.3
Energy Use by Energy Source (PJ)[a]				
Electricity	31.1		35.7	35.1
Natural Gas	23.2		26.3	23.7
Motor Gasoline	56.1		44.9	46.4
Diesel Fuel Oil	71.5		100.5	99.9
Light Fuel Oil	10.8		13.8	13.0
Kerosene	1.0		1.5	1.2
Heavy Fuel Oil	0.6		0.3	0.3
Propane	5.0		7.0	4.9
Steam	0.0		0.0	0.1
Activity				
GDP (million $97)[b]	13,627		13,614	14,693
Energy Intensity (MJ/$97)[a,b]	**14.6**		**16.9**	**15.3**
Total GHG Emissions Including Electricity (Mt)[a,c]	**13.7**		**16.0**	**16.0**
GHG Emissions by End-Use (Mt)[a,c]				
Non-Motive GHG Emissions	4.1		4.9	4.7
Motive GHG Emissions[1]	9.6		11.1	11.2
GHG Emissions by Energy Source (Mt)[a,c]				
Electricity	1.7		2.0	2.2
Natural Gas	1.2		1.3	1.2
Motor Gasoline	3.9		3.1	3.2
Diesel Fuel Oil	5.7		8.0	8.0
Light Fuel Oil	0.8		1.0	0.9
Kerosene	0.1		0.1	0.1
Heavy Fuel Oil	0.0		0.0	0.0
Propane	0.3		0.4	0.3
Steam	0.0		0.0	0.0
GHG Intensity (tonne/TJ)[a,c]	**69.0**		**69.5**	**71.1**
Total GHG Emissions Excluding Electricity (Mt)[a,c]	**12.0**		**14.0**	**13.8**
GHG Emissions by End-Use (Mt)[a,c]				
Non-Motive GHG Emissions	2.4		2.9	2.5
Motive GHG Emissions[1]	9.6		11.1	11.2
GHG Intensity (tonne/TJ)[a,c]	**60.2**		**61.0**	**61.4**

1) "Motive" includes motor gasoline and diesel fuel oil. All other energy sources are included in non-motive.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM).

b) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005.

c) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1999	2000	2001	2002	2003	Total Growth 1990–2003
229.9	**231.9**	**218.1**	**206.8**	**211.9**	**6.4%**
79.9	78.3	72.4	70.6	71.9	0.5%
150.0	153.6	145.7	136.2	140.0	9.7%
35.2	34.6	34.9	34.7	36.0	15.9%
24.1	27.3	23.3	22.5	22.6	-2.5%
47.3	46.8	49.7	52.5	53.5	-4.6%
102.7	106.8	96.0	83.6	86.5	20.9%
13.5	9.5	5.9	5.1	4.4	-59.6%
1.1	0.6	0.4	0.4	0.4	-63.6%
0.5	1.0	1.9	1.5	2.9	400.3%
5.4	5.4	5.9	6.3	5.6	13.0%
0.1	0.0	0.0	0.0	0.1	326.7%
15,980	15,181	13,056	12,499	14,148	3.8%
14.4	**15.3**	**16.7**	**16.5**	**15.0**	**2.5%**
16.3	**16.5**	**15.5**	**14.5**	**15.0**	**9.0%**
4.7	4.7	4.4	4.1	4.3	4.9%
11.5	11.8	11.2	10.4	10.7	10.8%
2.1	2.2	2.3	2.1	2.3	31.5%
1.2	1.4	1.2	1.1	1.1	-3.6%
3.3	3.3	3.5	3.7	3.7	-5.5%
8.2	8.6	7.7	6.7	6.9	22.1%
1.0	0.7	0.4	0.4	0.3	-59.7%
0.1	0.0	0.0	0.0	0.0	-63.6%
0.0	0.1	0.1	0.1	0.2	391.3%
0.3	0.3	0.4	0.4	0.3	14.0%
0.0	0.0	0.0	0.0	0.0	–
70.8	**71.1**	**71.3**	**70.2**	**70.7**	**2.5%**
14.2	**14.3**	**13.3**	**12.4**	**12.7**	**5.7%**
2.6	2.5	2.1	2.0	2.0	-14.7%
11.5	11.8	11.2	10.4	10.7	10.8%
61.6	**61.8**	**60.9**	**59.9**	**59.8**	**-0.6%**

Chapter 7
Electricity Generation Sector

The Data Situation

Energy use and production data for the electricity generation sector are reported in Statistics Canada's *Report on Energy Supply-Demand in Canada* (RESD) (Cat. No. 57-003-XIB). RESD does not provide energy use data for the electricity generated from wood and other non-specified fuel, hydro and nuclear categories. Electricity production data for these three energy sources are converted to energy use data using energy content values of 10.5, 3.6 and 11.564 megajoules per kilowatt-hour, respectively.

Gross domestic product data are provided by Informetrica Limited.

Due to rounding, the numbers in the tables may not add up or calculate to their reported totals or growth rates.

Electricity Generation Energy Use and Generation by Energy Source

	1990	1991–1996	1997	1998
Total Energy Use (PJ) [a]	3,002.0		3,533.3	3,536.0
Energy Use by Energy Source (PJ) [a]				
Natural Gas	80.0		192.6	234.6
Diesel Fuel Oil, Light Fuel Oil and Kerosene	11.5		8.0	8.6
Heavy Fuel Oil	141.4		101.0	153.6
Coal	874.5		1,000.4	1,091.4
Hydro	1,058.3		1,250.2	1,183.3
Nuclear	795.2		900.3	780.2
Wood and Other [1]	37.2		63.9	67.1
Petroleum Coke, Still Gas, Coke and Coke Oven Gas	3.8		16.8	17.3
Total Electricity Generated (GWh) [a]	467,596		556,076	545,078
Electricity Generated by Energy Source (GWh) [a]				
Natural Gas	9,018		20,031	24,477
Diesel Fuel Oil, Light Fuel Oil and Kerosene	994		975	863
Heavy Fuel Oil	13,394		10,194	15,240
Coal	76,794		92,903	100,130
Hydro	293,985		347,274	328,706
Nuclear	68,761		77,857	67,466
Wood and Other [1]	3,544		6,086	6,393
Petroleum Coke, Still Gas, Coke and Coke Oven Gas	1,107		756	1,803
Activity				
GDP (million $97) [b]	20,049		22,417	21,881
Production (GWh) [a]	467,596		556,076	545,078
Energy Intensity (GJ/$97) [a,c]	0.150		0.158	0.162
Energy Intensity (GJ/GWh) [a]	6.420		6.354	6.487

1991–1996 data available at: oee.nrcan.gc.ca/handbook05

1) "Wood and Other" includes wood waste and spent pulping liquor, manufactured gases, other petroleum products, other fuels and station service.

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1990–2003*, Ottawa, September 2004 (CANSIM)
Statistics Canada, *Report on Energy Supply-Demand in Canada, 2003 revisions*, Ottawa, January 2005

b) Natural Resources Canada, Electricity Energy Use Model, Ottawa, February 2005

c) Informetrica Limited, *TI Model and National Reference Forecast*, Ottawa, January 2005

1999	2000	2001	2002	2003	Total Growth 1990–2003
3,592.1	3,787.1	3,771.6	3,744.6	3,726.7	24.1%
247.5	319.2	339.7	310.7	337.4	321.8%
7.3	6.5	6.8	5.7	5.3	-54.2%
123.6	113.2	138.8	110.6	134.0	-5.2%
1,090.2	1,187.8	1,167.7	1,143.1	1,138.6	30.2%
1,231.8	1,277.3	1,187.6	1,248.8	1,204.4	13.8%
801.7	794.1	836.3	824.0	812.9	2.2%
71.0	70.2	74.5	80.5	74.0	98.9%
19.0	18.8	20.2	21.3	20.1	426.9%
559,930	585,814	569,420	581,072	568,028	21.5%
25,961	31,678	34,055	32,213	33,625	272.9%
756	798	890	870	776	-21.9%
12,483	11,540	13,657	11,153	14,913	11.3%
100,528	109,895	110,026	109,454	105,317	37.1%
342,167	354,812	329,881	346,898	334,560	13.8%
69,331	68,674	72,320	71,252	70,293	2.2%
6,760	6,682	7,095	7,665	7,049	98.9%
1,944	1,734	1,497	1,567	1,494	35.0%
21,883	21,651	20,853	21,297	20,724	3.4%
559,930	585,814	569,420	581,072	568,028	21.5%
0.164	0.175	0.181	0.176	0.180	20.1%
6.415	6.465	6.624	6.444	6.561	2.2%

Electricity Generation GHG Emissions by Energy Source

	1990	1991–1996	1997	1998
Total GHG Emissions (Mt) [a,b,c]	94.6		110.4	122.1
GHG Emissions by Energy Source (Mt) [a,b,c]				
Natural Gas	4.1		9.7	11.8
Diesel Fuel Oil, Light Fuel Oil and Kerosene	0.8		0.6	0.6
Heavy Fuel Oil	10.5		7.5	11.2
Coal	78.8		91.5	97.2
Hydro	0.0		0.0	0.0
Nuclear	0.0		0.0	0.0
Wood and Other [1]	0.0		0.0	0.0
Petroleum Coke, Still Gas, Coke and Coke Oven Gas	0.4		1.2	1.2
GHG Intensity [2] (tonne/TJ [electricity generated]) [a,b,c]	56.2		55.2	62.2
GHG Intensity [3] (tonne/TJ [energy used]) [a,b,c]	31.5		31.3	34.5

1991–1996 data available at oee.nrcan.gc.ca/handbook95

1) "Wood and Other" includes wood waste and spent pulping liquor, manufactured gases, other petroleum products, other fuels and station service.
2) Emissions per unit of electricity generated. This GHG emissions factor is applied to the end-use electricity consumption for the sectoral analysis including electricity-related emissions.
3) Emissions per unit of energy used to produce electricity. The difference between the two emissions factors represents conversion losses (energy used to produce electricity versus the amount of electricity generated).

Sources:

a) Statistics Canada, *Report on Energy Supply-Demand in Canada, 1998–2003*, Ottawa, September 2004 (CANSIM).
Statistics Canada, *Report on Energy Supply-Demand in Canada, 2003 revisions*, Ottawa, January 2005.
b) Natural Resources Canada, Electricity Energy Use Model, Ottawa, February 2005.
c) GHG emissions factors from Environment Canada, *Canada's Greenhouse Gas Inventory 1990–2002*, Ottawa, August 2004 (Cat. No. En49-5/5-10-2-2002E).

1999	2000	2001	2002	2003	Total Growth 1990–2003
120.1	131.7	132.8	127.9	130.4	37.8%
12.4	16.1	17.1	15.6	16.9	317.2%
0.5	0.5	0.5	0.4	0.4	-54.0%
9.0	8.3	10.2	8.1	9.8	-7.0%
96.8	105.5	103.6	102.3	101.7	29.1%
0.0	0.0	0.0	0.0	0.0	..
0.0	0.0	0.0	0.0	0.0	..
0.0	0.0	0.0	0.0	0.0	..
1.3	1.3	1.4	1.5	1.5	330.0%
59.6	62.4	64.8	61.2	63.8	13.4%
33.4	34.8	35.2	34.2	35.0	11.6%

Reconciliation of Data on Energy Use Found in This Handbook With Data in Statistics Canada's *Report on Energy Supply-Demand in Canada* (RESD) – 2003 (petajoules)

	RESD Data	Residential Wood	Commercial & Public Admin. Diesel	Commercial & Public Admin. Aviation Fuels
Sector				
Residential	1,348	110		
Commercial/Institutional	1,490		(188)	(26)
Industrial	2,313			
Transportation	2,242		188	26
Agriculture	212			
Final Demand	***7,605***	***110***	***0***	***0***
Non-Energy	903			
Producer Consumption	1,287			
Net Supply	***9,796***	***110***	***0***	***0***
Fuel Conversion				
Electricity, Steam & Coal/Coke Input Fuels[1]	3,883			
Electricity, Steam & Coal/Coke Production[2]	(2,202)			
Total Primary	***11,477***	***110***	***0***	***0***

Notes on sources of energy use data for five end-use sectors:

Residential: Base data taken from RESD (Table 1A, line 44) plus residential wood use (estimated from NRCan's Residential End Use Model).

Commercial/Institutional: Base data taken from RESD (Table 1A, line 45 plus line 46) less commercial and public administration motor gasoline, diesel, aviation gasoline and aviation turbo fuel (Table 1B, motor gasoline, diesel, aviation gasoline and aviation turbo fuel columns, line 45 plus line 46).

Industrial: Base data taken from RESD (Table 1A, line 31) plus solid wood waste and spent pulping liquor (Table 2B) less wood waste and spent pulping liquor used for electricity generation (Table 1B) multiplied by a conversion factor, plus producer consumption by refining and mining industries of still gas, diesel, heavy fuel oil, light fuel oil, kerosene, petroleum coke and refinery LPG (Table 1B, still gas, diesel, heavy fuel oil, light fuel oil, kerosene, petroleum coke and refinery LPG columns, line 16), plus waste fuels (Canadian Industrial Energy End-Use Data and Analysis Centre).

Transportation: Base data taken from RESD (Table 1A, line 42) less pipeline fuels (Table 1A, line 39) plus commercial and public administration motor gasoline, diesel, aviation gasoline and aviation turbo fuel (Table 1B, motor gasoline, diesel, aviation gasoline and aviation turbo fuel columns, line 45 plus line 46).

Agriculture: Base data taken from RESD (Table 1A, line 43).

1) "Electricity, Steam & Coal/Coke Input Fuels" represents the amount of input energy from source fuels (coal, uranium, etc.) that is transformed to electricity, steam, coke and coke gas.
2) "Electricity, Steam & Coal/Coke Production" represents the amount of electricity, steam, coke and coke gas produced. The difference between these items is referred to as conversion losses.

Commercial & Public Admin. Motor Gasoline	Pipeline Fuels	Wood Waste & Pulping Liquor	Waste Fuels Used in Cement Industry	Re-Allocation of Producer Consumption by Refineries and Mining Industries	Data Presented in This Handbook
					1,458
(95)					1,181
		465	3	465	3,246
95	(190)				2,361
					212
0	*(190)*	*465*	*3*	*465*	*6,458*
					903
	190			(465)	1,812
0	*0*	*465*	*3*	*0*	*10,173*
					3,880
					(2,399)
0	*0*	*465*	*3*	*0*	*12,654*

Appendix B
Reconciliation of Definitions

Reconciliation of Definitions for Estimated Greenhouse Gas Emissions Found in This Handbook With Environment Canada's *Canada's Greenhouse Gas Inventory 1990–2002*

Introduction

In this handbook, the data on greenhouse gas (GHG) emissions are estimated using emissions factors developed by Environment Canada (EC). The emissions estimates provided herein mirror the sectoral definitions used to calculate the estimates presented in *Canada's Greenhouse Gas Inventory: 1990–2002* (CGGI-2002). Both Natural Resources Canada (NRCan) and EC use the energy demand data from Statistics Canada's *Report on Energy Supply-Demand in Canada* (RESD) as a base. However, the two organizations use different sectoral mappings. EC prepares its emissions inventory according to the specifications of the Intergovernmental Panel on Climate Change. NRCan, meanwhile, has developed mapping that is most suited to energy end-use analysis.

The objective of this appendix is to help readers understand the similarities and differences between CGGI-2002 and NRCan emissions estimates for the six sectors covered in this handbook.

Residential Sector

NRCan and CGGI-2002 differ in their definitions of residential emissions.

- NRCan residential emissions include end-use electricity-related emissions, which are reported under power generation in CGGI-2002.
- Wood energy use differs (EC's estimate is larger than NRCan's). Hence, the GHG emissions related to wood energy use presented here are less than those in CGGI-2002.

Commercial/Institutional Sector

There is only one difference between NRCan and CGGI-2002 definitions of commercial/institutional emissions.

- NRCan commercial/institutional emissions include end-use electricity-related emissions, which CGGI-2002 includes under power generation.

Industrial Sector

There are many differences between CGGI-2002 and this handbook in defining the industrial sector.

- CGGI-2002 re-allocates industrial diesel fuel oil use from the industrial sector to the transportation sector.
- This handbook re-allocates the petroleum refining and upstream mining industry's producer consumption of petroleum products from the producer consumption sector to the petroleum refining and upstream mining sector within the industrial sector. CGGI-2002 reports this as consumption of fossil fuels.
- CGGI-2002 re-allocates industrial coke use from energy use in the industrial sector to non-energy use in industrial processes.
- NRCan industrial emissions include end-use electricity-related emissions. CGGI-2002 reports them under power generation.
- CGGI-2002 includes producers' consumption of non-fossil fuels in the fossil fuel categories. NRCan does not report this consumption.
- CGGI-2002 also re-allocates estimates of emissions from upstream oil and gas flaring to fugitive emissions from the fossil fuel sector.

Transportation Sector

Differences in the transportation sector relate to CGGI-2002 re-allocating or excluding RESD data from its inventory, whereas NRCan allocates end-use electricity-related emissions to the end-use sectors.

- CGGI-2002 re-allocates industrial and agriculture diesel fuel oil and agriculture motor gasoline to the transportation sector.
- CGGI-2002 includes pipeline-related emissions in the transportation sector.
- CGGI-2002 excludes emissions resulting from the use of energy in the foreign aviation and marine sub-sectors.
- NRCan transportation emissions include end-use electricity-related emissions, which are reported under power generation in CGGI-2002.

Agriculture Sector

There are two differences between CGGI-2002 and NRCan in the agriculture sector.

- CGGI-2002 allocates all farm diesel fuel oil and motor gasoline to the transportation sector, whereas NRCan leaves this consumption in agriculture (as does RESD).
- NRCan includes end-use electricity-related emissions in agriculture, whereas CGGI-2002 reports them under power generation.

Electricity Generation Sector

There is only one difference between CGGI-2002 and NRCan for the electricity generation sector.

- CGGI-2002 reports emissions from electricity and steam generation, while NRCan reports emissions for electricity generation only.

Appendix C
Glossary of Terms

Activity: Term used to characterize major drivers of energy use in a sector (e.g. floor space area in the commercial/institutional sector).

AECO-C Hub: A hub is a market centre where several pipelines interconnect and where many buyers and sellers trade gas, thereby creating a liquid pricing point. The AECO-C hub is the main pricing point for Alberta natural gas and represents the major pricing point for Canadian gas. Prices are determined via the spot market, which includes all transactions for sales of 30 days or less, but most typically refers to a 30-day sale.

Apartment: This type of dwelling includes dwelling units in apartment blocks or apartment hotels; flats in duplexes or triplexes (i.e. where the division between dwelling units is horizontal); suites in structurally converted houses; living quarters located above or in the rear of stores, restaurants, garages or other business premises; janitors' quarters in schools, churches, warehouses, etc.; and private quarters for employees in hospitals or other types of institutions.

Appliance: Energy-consuming equipment used in the home for purposes other than air conditioning, centralized water heating and lighting. Includes cooking appliances (gas stoves and ovens, electric stoves and ovens, microwave ovens, and propane or gas grills); cooling appliances (evaporative coolers, attic fans, window or ceiling fans, and portable or table fans); and refrigerators, freezers, clothes washers, dishwashers, clothes dryers, outdoor gas lights, dehumidifiers, personal computers, pumps for well water, televisions, water-bed heaters, swimming pool heaters, hot tubs and spas.

Biomass: Includes wood waste and pulping liquor. Wood waste is a fuel consisting of bark, shavings, sawdust and low-grade lumber and lumber rejects from the operation of pulp mills, sawmills and plywood mills. Pulping liquor is a substance primarily made up of lignin and other wood constituents and chemicals that are by-products of the manufacture of chemical pulp. It can produce steam for industrial processes when burned in a boiler and/or produce electricity through thermal generation.

Capacity Utilization: The rates of capacity use are measures of the intensity with which industries use their production capacity. It is the ratio of an industry's actual output to its estimated potential output.

Carbon Dioxide (CO_2): A compound of carbon and oxygen formed whenever carbon is burned. Carbon dioxide is a colourless gas that absorbs infrared radiation, mostly at wavelengths between 12 and 18 microns. It behaves as a one-way filter, allowing incoming, visible light to pass through in one direction, while preventing outgoing infrared radiation from passing in the opposite direction. The one-way filtering effect of carbon dioxide causes an excess of the infrared radiation to be trapped in the atmosphere; thus it acts as a "greenhouse" and has the potential to increase the surface temperature of the planet.

Company Average Fuel Consumption (CAFC): The Government of Canada encourages improvements in the fuel efficiency of the Canadian new vehicle fleet by setting voluntary annual company average fuel consumption (CAFC) goals for vehicle manufacturers and importers.

Conversion Loss: The energy lost during the conversion from primary energy (petroleum, natural gas, coal, hydro, uranium, wind, biomass and solar energy) into electrical energy. Losses occur during generation, transmission and distribution of electricity, and include plant and unaccounted-for uses.

Cooling Degree-Day (CDD): A measure of how hot a location was over a period of time, relative to a base temperature. In this handbook, the base temperature is 18.0 C and the period of time is one year. If the daily average temperature exceeds the base temperature, the number of cooling degree-days for that day is the difference between the two temperatures. However, if the daily average is equal to or less than the base temperature, the number of cooling degree-days for that day is zero. The number of cooling degree-days for a longer period of time is the sum of the daily cooling degree-days from the days in the period.

Cooling Degree-Day Index: A measure of how relatively hot (or cold) a year was when compared with the cooling degree-day (CDD) average. When the CDD index is above (below) 1, the observed temperature is warmer (colder) than normal. The CDD normal represents a weighted average of the 1951–1980 CDDs observed in a number of weather stations across Canada. Its value, which varies from year to year because of the flow of population, was 171 CDDs in 2003.

Dwelling: A dwelling is defined as a structurally separate set of living premises with a private entrance from outside the building or from a common hallway or stairway inside. A private dwelling is one in which one person, a family or other small group of individuals may reside, such as a single house, apartment, etc.

End-Use: Any specific activity that requires energy (e.g. refrigeration, space heating, water heating, manufacturing processes and feedstocks).

Energy Intensity: The amount of energy used per unit of activity. Examples of activity measures in this report are households, floor space, passenger-kilometres, tonne-kilometres, physical units of production and constant dollar value of gross domestic product.

Energy Source: Any substance that supplies heat or power (e.g. petroleum, natural gas, coal, renewable energy and electricity, including the use of a fuel as a non-energy feedstock).

Floor Space (area): The area enclosed by exterior walls of a building. In the residential sector, it excludes parking areas, basements or other floors below ground level; these areas are included in the commercial/institutional sector. It is measured in square metres.

Gigajoule (GJ): One gigajoule equals 1×10^9 joules (see Petajoule).

Greenhouse Gas (GHG): A greenhouse gas absorbs and radiates heat in the lower atmosphere that otherwise would be lost in space. The greenhouse effect is essential for life on this planet, since it keeps average global temperatures high enough to support plant and animal growth. The main greenhouse gases are carbon dioxide (CO_2), methane (CH_4), chlorofluorocarbons (CFCs) and nitrous oxide (N_2O). By far the most abundant greenhouse gas is CO_2, accounting for about 70 percent of total greenhouse gas emissions (see Carbon Dioxide).

Greenhouse Gas Intensity of Energy: The amount of greenhouse gas emitted per unit of energy used.

Gross Domestic Product (GDP): The total value of goods and services produced within Canada during a given year. Also referred to as annual economic output or, more simply, output. To avoid counting the same output more than once, GDP includes only final goods and services – not those that are used to make another product. GDP figures are reported in constant 1997 dollars.

Gross Output (GO): The total value of goods and services produced by an industry. It is the sum of the industry's shipments plus the change in value due to labour and capital investment. Gross output figures are reported in constant 1997 dollars.

Heat Gain: Heat gained by a building from the operation of appliances. These heat gains reduce the space heating load in the winter and increase the space cooling load in the summer.

Heat Loss: Represents the amount of energy released as heat by an appliance or piece of equipment while it is in operation.

Heating Degree-Day (HDD): A measure of how cold a location was over a period of time relative to a base temperature. In this handbook, the base temperature is 18.0°C, and the period of time is one year. If the daily average temperature is below the base temperature, the number of heating degree-days for that day is the difference between the two temperatures. However, if the daily average temperature is equal to or higher than the base temperature, the number of heating degree-days for that day is zero. The number of heating degree-days for a longer period of time is the sum of the daily heating degree-days for the days in that period.

Heating Degree-Day Index: A measure of how relatively cold (or hot) a year was when compared with the heating degree-day (HDD) average. When the HDD index is above (below) 1, the observed temperature is colder (warmer) than normal. The HDD normal represents a weighted average of the 1951–1980 HDDs observed in a number of weather stations across Canada. Its value, which varies from year to year because of the flow of population, was 4473 HDDs in 2003.

Heavy Truck: A truck with a gross vehicle weight that is more than, or equal to, 14,970 kg (33,001 lb.). The gross vehicle weight is the weight of the empty vehicle plus the maximum anticipated load weight.

Household: A person or a group of people occupying one dwelling unit is defined as a household. The number of households will, therefore, be equal to the number of occupied dwellings. The person or people occupying a private dwelling form a private household.

Housing Stock: The physical number of dwellings is referred to as the housing stock. As opposed to the number of households, which refers to the number of occupied dwellings, housing stock takes into account both occupied and unoccupied dwellings.

Kilowatt-hour (kWh): The commercial unit of electricity energy equivalent to 1000 watt-hours. A kilowatt-hour can best be visualized as the amount of electricity consumed by ten 100-watt bulbs burning for an hour. One kilowatt-hour equals 3.6 million joules (see Watt).

Large Car: A car with a gross vehicle weight of 1182 kg (2601 lb.) or more. The gross vehicle weight is the weight of the empty vehicle plus the maximum anticipated load weight.

Light Truck: A truck of up to 3855 kg (8500 lb.) of gross vehicle weight. The gross vehicle weight is the weight of the empty vehicle plus the maximum anticipated load weight. This class of vehicles includes pickup trucks, minivans and sport utility vehicles.

Liquefied Petroleum Gases (LPG) and Gas Plant Natural Gas Liquids (NGL): Propane and butane are liquefied gases extracted from natural gas (i.e. gas plant NGL) or from refined petroleum products (i.e. LPG) at the processing plant.

Medium Truck: A truck with a gross vehicle weight ranging from 3856 to 14,969 kg (8501 to 33,000 lb.). The gross vehicle weight is the weight of the empty vehicle plus the maximum anticipated load weight.

Megajoule (MJ): One megajoule equals 1×10^6 joules (see Petajoule).

Mobile Home: A moveable dwelling designed and constructed to be transported by road on its own chassis to a site and placed on a temporary foundation (such as blocks, posts or a prepared pad). If required, it can be moved to a new location.

Model Year: An annual period (beginning in September and ending in August) in which a national automotive industry organizes its operations and within which new models are announced. For example, if the "model year" is 2003, it begins 1 September 2002 and ends 31 August 2003.

Multifactor Productivity: The ratio of output per unit of combined inputs (capital services and labour services).

North American Industry Classification System (NAICS): A classification system that categorizes establishments into groups with similar economic activities. The structure of NAICS, adopted by Statistics Canada in 1997 to replace the 1980 Standard Industrial Classification (SIC), has been developed by the statistical agencies of Canada, Mexico and the United States.

Passenger-kilometre (Pkm): The transport of one passenger over a distance of one kilometre.

Petajoule (PJ): One petajoule equals 1×10^{15} joules. A joule is the international unit of measure of energy – the energy produced by the power of one watt flowing for a second. There are 3.6 million joules in one kilowatt-hour (see Kilowatt-hour).

Pulping Liquor: A substance primarily made up of lignin, other wood constituents and chemicals that are by-products of the manufacture of chemical pulp. It can produce steam for industrial processes when burned in a boiler and/or produce electricity through thermal generation.

Sector: The broadest category for which energy consumption and intensity are considered within the Canadian economy (e.g. residential, commercial/institutional, industrial, transportation, agriculture and electricity generation).

Single Attached (dwelling): Each half of a semi-detached (double) house and each section of a row or terrace are defined as single attached dwellings. A single dwelling attached to a non-residential structure also belongs to this category.

Single Detached (dwelling): This type of dwelling is commonly called a single house (i.e. a house containing one dwelling unit and completely separated on all sides from any other building or structure).

Small Car: A car weighing up to 1181 kg (2600 lb.) of gross vehicle weight. The gross vehicle weight is the weight of the empty vehicle plus the maximum anticipated load weight.

Space Cooling: Conditioning of room air for human comfort by a refrigeration unit (e.g. air conditioner or heat pump) or by circulating chilled water through a central- or district-cooling system.

Space Heating: The use of mechanical equipment to heat all or part of a building. Includes the principal space heating unit and any supplementary equipment.

Standard Industrial Classification (SIC): A classification system that categorizes establishments into groups with similar economic activities.

Terajoule (TJ): One terajoule equals 1×10^{12} joules (see Petajoule).

Tonne-kilometre (Tkm): The transport of one tonne over a distance of one kilometre.

Vintage: The year of origin or age since the construction of a unit of capital stock (e.g. a building or a car).

Waste Fuel: A name applied to any number of energy sources outside of conventional fuels. It can include materials such as tires, municipal waste and landfill off-gases.

Water Heater: An automatically controlled vessel designed for heating water and storing heated water.

Water Heating: The use of energy to heat water for hot running water, as well as the use of energy to heat water on stoves and in auxiliary water heating equipment for bathing, cleaning and other non-cooking applications.

Watt (W): A measure of power; for example, a 40-watt light bulb uses 40 watts of electricity (see Kilowatt-hour).

Wood Waste: Fuel consisting of bark, shavings, sawdust, low-grade lumber and lumber rejects from the operation of pulp mills, sawmills and plywood mills.

Appendix D
List of Abbreviations

$97	Constant 1997 dollars
bbl.	Barrel
CAFC	Company Average Fuel Consumption
CANSIM	Canadian Socio-Economic Information Management System
CEUM	Commercial/Institutional End-Use Model
CIEEDAC	Canadian Industrial Energy End-Use Data and Analysis Centre
EC	Environment Canada
EER	Energy Efficiency Ratio
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GJ	Gigajoule = 1 x 10^9 joules
GO	Gross Output
GWh	Gigawatt-hour = 1 x 10^9 Wh
km	Kilometre
kW	Kilowatt
kWh	Kilowatt-hour = 1 x 10^3 Wh
L	Litre
LPG	Liquefied Petroleum Gases
m^2	Square Metre
m^3	Cubic Metre
MJ	Megajoule = 1 x 10^6 joules
Mt	Megatonne = 1 x 10^6 tonnes
NAICS	North American Industry Classification System
n.e.c.	Not Elsewhere Classified
NEUD	National Energy Use Database
NGL	Natural Gas Liquids
NRCan	Natural Resources Canada
OEE	Office of Energy Efficiency
PJ	Petajoule = 1 x 10^{15} joules
Pkm	Passenger-kilometre
RESD	*Report on Energy Supply-Demand in Canada*
REUM	Residential End-Use Model
SEER	Seasonal Energy Efficiency Ratio
SIC	Standard Industrial Classification
TEUM	Transportation End-Use Model
TJ	Terajoule = 1 x 10^{12} joules
Tkm	Tonne-kilometre
UEC	Unit of Energy Consumption
W	Watt
Wh	Watt-hour

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